DOCUMENT RESUME

ED 087 793 TM 003 415

TITLE	COLAMDA Evaluation, 1970-71.
INSTITUTION	Douglas County School District RE-1, Castle Rock, Colo.; Regional Center for Pre-Coll. Mathematics, Denver, Colo.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.; Colorado State Dept. of Education, Denver.
PUB DATE	71
NOTE	81p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Course Evaluation; Formative Evaluation; Individualized Instruction; *Low Achievers; *Mathematics; Mathematics Instruction; Questionnaires; *Secondary School Mathematics; *Summative Evaluation
IDENTIFIERS	*Committee Low Achievers Mathematics Denver Area; Elementary Secondary Education Act Title III; ESEA Title III; Project COLAMDA

ABSTRACT

This report is an evaluation of the Committee of Low-Achievers in Mathematics-Denver Area (COLAMDA) Project, a mathematics program involving diagnosis, prescription, and implementation for use with low achievers in grades seven thru twelve. It contains an assessment of 1970-71 project year by a resource technician. An on-site evaluation report describes the evaluation team which visited different school sites, conferred with teachers and administrators and compiled a list of specific strengths, weaknesses, comments, and recommendations for COLAMDA. A report on the student evaluation of the teacher along with observation of the same teachers by trained personnel is also included. The appendix contains the instruments used to evaluate the COLAMDA project from 1968-1971. These instruments include: student questionnaires; student standardized achievement test results; workshop questionnaires; material usage; administrator interview; teacher rating scales and personal opinion scales. For related document see also TM 003 404. (MP)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED 087793

COLAMDA

evaluation report

003 415-16

ED 087793

TM 003 415

COLAMDA EVALUATION

COLAMDA

Title III ESEA
Douglas County School District Re. 1
Lowell Baumunk, Superintendent
P.O. Box Q Castle Rock, Colorado

TABLE OF CONTENTS

	PAGE NUMBER
PREFACE	1
ASSESSMENT OF 1970-71 PROJECT YEAR	4
1970-71 EVALUATION OF TITLE III ESEA PROJECT	9
GENERAL SUMMARY OF PROJECT RESULTS	15
EFFECTS OF TEACHERS' PERSONALITY SYSTEMS, SUBJECT MATTER AND STUDENT'S PERSONALITY SYSTEMS OF TEACHER EVALUATION	19
APPENDIX	29

PREFACE

PREFACE

By Dan Colvin, Project Evaluator

What is COLAMDA? COLAMDA is not old ideas written a new way; COLAMDA is people, people who care about kids and other people. COLAMDA is people who share their own ideas and create new ones; people who are sensitive to others needs; people who want to help; people who love.

What has COLAMDA accomplished the past three years? Evaluation data indicates that the project has reached or surpassed all of its objectives. COLAMDA has made significant contributions to the enrichment of mathematics for the low achiever and has caused kids to care about school.

Students who have participated in the project have gained an average of 1.2 years of academic growth in a nine month school year. But the question comes to my mind, "Is this the most important contribution the project has made?" In the opinion of the people involved in the project, the main contribution is the changing of attitude of both teacher and student toward all aspects of school. Teachers finding success and dedication to helping kids find themselves, kids enjoying school and ceasing to be discipline problems and school dropouts, kids seeing the need for school work and COLAMDA furnishing creative and useful activities for the low achiever all indicate how attitude can change school environment.

What is COLAMDA? What has COLAMDA accomplished the past three years? Perhaps the answer could be expressed this way: teacher sharing with student; teacher sharing with administrator; teacher sharing with teacher; people sharing with one another.

It has been expressed by many educators that many of the ideas, planning, and the development of a laboratory environment will prevail in other areas of instruction. COLAMDA does have a working model and it is the desire of the staff that this model continue to be utilized.

The following documents are submitted as the result of three years' discussing, assessing, and exchanging ideas with participating teachers, administrators, and staff of the COLAMDA project.

1970-71 Project Assessment

By Jeff Pryor

ASSESSMENT OF THE 1970-71 PROJECT YEAR

In the past year (1970-71), I have been affiliated with the COLAMDA Project as a resource technician. My responsibilities have included the design, production, and implementation of tools and procedures for dissemination and diffusion, circulating and scoring evaluation instruments, and field analysis of teacher and student attitudes.

This summary is written with the desire to offer calculated and measured criticism as objectively as possible. I am dedicated to the idea of creative education, personalized instruction; and I believe in Thoreau's (et al) idea of "each one teach one." This assessment may be termed "gut level", but I offer it as worthwhile personal endeavor with the intent that the reader may find it beneficial.

I have visited the classrooms of more than seventy-five percent of the participating teachers in the COLAMDA Project, observed classes and interviewed students involved. With this experience and having attended COLAMDA workshops, meetings, district seminars, and circulating among the COLAMDA staff on many occasions, I feel that I have a good understanding of the objectives and philosophy of the COLAMDA Project.

The rationale for the COLAMDA Project is quite clear. It is an understatement to say that the reluctant learner has been overlooked in education, especially in mathematics education. Mathematics has been the nadir of misunderstanding and frustrations for kids with learning problems.

COLAMDA has taken to task a system that has perpetually destroyed the learning capabilities of many youth. It has attempted to change the most immutable of all institutions - attitude. To expect great changes in achievement and attitude in one to three years is sacroscant, but COLAMDA is working.

In visiting classrooms I have been impressed with teacher commitment to the project, but even more with their concern for the students. This commitment is an abstract expression that cannot be measured on any attitudinal scale. The teachers care about their students as both learners and as individuals. Content importance is being supplanted by student importance and the enthusiasm displayed by the teachers infects the students with the desire to learn. Learning then becomes an activity available to all who break down personal barriers and decide that teaching as well as learning is a "two-way street."

COLAMDA teachers on the whole have been willing to devote the extra time and effort needed for preparation; to become physically and emotionally involved and by doing so, affect the reluctant learner. Most project teachers enjoy the challenge of working with the low achiever even though it is generally considered to be very frustrating, with little or no immediate reward or status. Few teachers openly admit distaste for working with the low achiever and voice a preference to work with average or above average learners.

It seems that some teachers have missed the most significant aspect of COLAMDA--the philosophy regarding the reluctant learner. These teachers have viewed COLAMDA solely as a material "mill." Instructional materials, to be sure, are an important part of COLAMDA operations, but hopefully, the project has been oriented to influencing attitudinal change in both teachers and students.

There are teachers who are not willing to take the extra effort to search out COLAMDA material not demonstrated in COLAMDA workshops or in-service meetings. (see COLAMDA materials questionnaire) These teachers were not willing or able to adapt the material to meet specific needs. COLAMDA provides such a multitude of materials that are widely based in function, principle and practice that it is hard to understand why there would ever be any reason for redundancy or shortage of material.

Finally, the diffusion responsibility of the classroom teacher has been neglected. Very few teachers have taken the initiative to introduce COLAMDA to other teachers. The commitment of administrators and building personnel to the program is absolutely essential for the continuation of COLAMDA. With the termination of the Title III funds and with no central agency providing the training, organization, materials and incentive for continuation, COLAMDA will wither if an effective diffusion plan is not immediately inaugurated.

A major part of my visitations to the schools has involved talking with the students. I have attempted to ascertain their opinions without being "pushy" or directive in my interviews. The students have been enthusiastic about their mathematics class. When asked to compare their past experience in math with their present experience with with their new teacher, they were overwhelmingly positive about the changes. Many expressed contempt for school and most of their classes, but they respected and trusted their mathematics teacher. Most students admitted that they did not like math, they did not understand math, but with this new approach, they felt comfortable with math and they were actually learning. I feel that there are some teachers who have been responsible for entire attitudinal changes in their students. Students who had been complacent or openly rebellious before became interested in achieving. These kids are not coming to math labs for an obtuse curriculum guide, they're there because they want to be, because they're learning for the first time and they like it. I look at these kids, the heart of the COLAMDA program, and I see that it is working and I shudder to think of the eventual death of this success because of the lack of commitment evident in many COLAMDA participants.

COLAMDA has been a successful program, with exceptional teachers and staff members. The program has improved student performance levels on scales that in

my opinion are not the best determiners of positive effectiveness of the progam. (see pre and post test scores) It has seemingly helped teachers who had been frustrated teaching low achievers by assisting them in forming new teachin, practices, using better teaching devices and changing teacher attitudes. The teachers who had previously been successful with the low achiever benefited from COLAMDA through the provision of new material and the arena for interaction.

COLAMDA is a large project working with many schools, teachers and students. Its size is a handicap because of the "befuddling" effect of administrative details, material production, number of participants, etc., but even with this the redeeming factor is that the program is working and working well. COLAMDA is a program where people do care, share and dare. It would be a definite loss to witness COLAMDA's death. It is a challenge to the participants of COLAMDA, the staff members, the teachers, the administrators and coordinators to keep the program vibrant. But, most important we need to give the kids, the reluctant learners, who have been so often overlooked, the chance to know success and to succeed. How can we let them down?

On-Site Evaluation Report

of the Title III ESEA Project

COLAMDA

Project Sponsored by

Douglas County School District Re. 1

March 31 - April 1, 1971

EVALUATION OF TITLE III ESEA PROJECT

Project Title:	Committee on Low Achievers in Mathematics - Denver Area COLAMDA
School District:	Douglas County School District Re. I Castle Rock, Colorado (Fifteen Participating Agencies)
Project Director:	Mr. Terry Shoemaker
Date:	March 31-April 1, 1971
Evaluation Team:	Bruce Broderius, Team Leader University of Northern Colorado
	Barry Beal Denver Public Schools
	Carl Godard Colorado Department of Education
	Lyle Johnson Cherry Creek Public Schools
	Ronald Steinke Arapahoe Community College
	Marc Swadener University of Colorado
	Daniel Tredway Western State College

The on-site evaluation of the ESEA Title III project entitled "Committee On Low Achievers in Mathematics - Denver Area" was completed in accordance with the requirements of the Elementary and Secondary Education Act of 1965 and the approved state plan for Colorado.

All members of the evaluation team wish to express their appreciation to the members of the project staff who met with the group. A special "thank you" is extended to the Project Director, Mr. Terry Shoemaker, the project staff and, teachers and pupils of the participating school districts for providing important information and assisting the visitors in every way possible. The evaluation team convened on March 31, 1971, at 8:00 a.m. At this meeting, the purpose of the visit was discussed with the evaluation team; the project staff presented: (1) an overview of the project, (2) a description of the materials in use, (3) a description of the inservice and exchange programs and (4) a review of the general develop-ment and integration of new curriculum into on-going school programs. A general dialogue among the project staff and evaluation team followed.

On March 31 and April 1, 1971 the team visited 31 different school sites, conferring with 39 teachers and 19 school administrators, for additional examination, review and explanation of the project.

SECTION I - Specific Evaluation by Criteria, *Ranking by Means, **Mean and **Range
*Ranking is on a scale from 1 (high) to 16 (low)
**Evaluation was on a scale from 1 (high) to 5 (low)

Criteria	Rank	Mean	Range
Current direction of the project is consistent with stated objectives.	6	1.71	1-2
Teacher, administrators, and pupils who are involved with the project are aware of the objectives of the project.	9	1.85	1-3
Existing policies and practices in the district(s) are conducive to accomplishment of the objectives.	6	1.71	1-2
Project activities are appropriate for meeting stated objectives.	1	1.28	1-3
It appears, at present, that reasonable progress is being made toward meeting objectives of the project.	4	1.43	1-2
Dissemination of information about the project within the district(s) is appropriate and adequate. Consider Board of Education, professional staff, the lay public and pupils.	10	2.14	1-4
There are adequate safeguards against possible negative effects of the program on children. Consider overexposure to visitors, subjection to questionable experimental activities, disruption of other vital learning activity, etc.	4	1.43	1-4
Physical resources are appropriate and adequate for achievement of project objectives.	11	2.28	1-3
Human resources are numerically adequate for the achievement of objectives. Consider both regular staff and possible outside consultants.	11	2.28	1-3
Project personnel have qualities essential to the success of the project. Consider open-mindedness, creativity, specialized knowledge, administrative ability, communication skills, etc.	3	1.42	1-2
The budget is appropriate for current operation of the project.	15	2.71	1-5
There is evidence of good administrative leadership practice in leadership, supervision, and fiscal management.	1	1.28	1-2
Provisions are being made for integration of successful project activities into the regular school programs.	6	1.71	1-3
The Board of Education and administrative staff are committed to support of successful project activities after federal funding ends.	14	2.42	1-5
Evaluation practices being followed and measuring instruments in current use are appropriate for measuring the achievement of objectives.	11	2.28	1-3
Provisions for follow-up activities are appropriate and adequate.	16	3.71	2-5

SECTION II - Strengths, Weaknesses, Comments and Recommendations

A. Strengths of the Project

1. Strong support from local education agencies and a wide range of administrators.

2. Commitment to the project and objectives by the project staff, consultants, and instructing teachers.

3. Project staff dedication to the concepts of:

   a. personalized instruction
   b. sharing
   c. caring about students, how they learn, and what happens to them in mathematics
   d. unless you change the teacher, you can't change the student

4. Appeal of the materials to the low achiever as intended and extension of the attention span and interest level of all math students.

5. Success oriented teaching for the teacher and success oriented learning for student.

6. Excellent communication between COLAMDA teachers and other math instructors within their buildings and among the various school districts. This has resulted in diffusion of COLAMDA approaches throughout math departments in nearly all schools of the districts involved.

7. Changes in teacher techniques and as a result the attitudes of students who are underachieving in math.

8. Provision of concrete supplementary materials, techniques, strategies, concepts and an attitude of creativity to teachers rather than a programmed lock-step curriculum approach.

9. Provision by the COLAMDA materials for ways of approaching learning other than the traditional textbook approach. The materials actually change the pace of learning. It is a meaningful application of math processed while allowing a significant degree of flexibility in the project classrooms.

10. Provision of concepts and materials created by teachers acceptable as "field tested" and/or which can be changed to meet their specific needs. These concepts can and have been transferred to other disciplines as well.

11. Continually reaching teachers with COLAMDA concept through inservice efforts.

12. An emphasis on affective and congitive changes in students as well as teachers.

13. Many opportunities opened for significant research in mathematics education.

B. Weaknesses of the Project

1. Physical limitations of classes using COLAMDA materials and teachers having to be mobile rather than stationary where a math laboratory approach could be easier and better utilized.

2. The awesome responsibility of diffusing the COLAMDA criteria, objectives and concept to the total Metropolitan Denver area and beyond. The project could have been limited to a demonstration model and greater stress placed on effectiveness of materials before being disseminated to the total metropolitan area.

3. Limited released time for Denver Public Schools and other teachers to share concepts, resulting in weakening the teachers' use of materials.

4. Follow-up procedures in a project of this size. It is obvious that the procedures were weak due to the lack of time and adequate number of staff to administer adequate follow-up assessment.

5. Teachers not knowing how to use all the materials provided by the project. Also, how to get the correct materials to the appropriate student at the proper time.

6. Some teachers denying some low achieving studetns the materials until those students have completed routine pencil and paper worksheets and book work.

7. The project staff not having the benefit of research analysis done by Dr. O. J. Harvey in time to show those particular results or possible impact on the project.

8. Some type of planning which would provide for an on-going schematic progression for COLAMDA materials so that students in the program for more than one year would get new concepts and approaches as they progress through the grades. This need was recognized by the project staff, but was not generally met.

9. The lack of control groups in research design leaving the project without this type of data indicate extent of program effectiveness. Observed growth may be due to a regression effect.

10. The possibility that some social stigma may be attached to being in a COLAMDA class.

11. That so many fine opportunities to explore relationships between variables relative to achievement in mathematics for low achieving pupils could not be investigated.

12. That use of para-professionals were not retained as an integral part of the program.

C. Comments

1. This project has many exemplary features and potential for improving instruction. The continuation of some organization in which teachers could exchange ideas and provide for additional dissemination would be highly beneficial. Dissemination on a national level also would be a desirable follow-up activity. Extension of this program's philosophy and activities to both elementary and senior high school should be further explored and possibilities for funding investigated.

2. Whatever weaknesses this project may have are far outweighed by its strengths. The COLAMDA staff should be complimented on a major contribution to mathematics education. If funding could be found to continue a central office to coordinate new materials as they are developed, this important program would have an increased opportunity of a further, positive impact on education.

D. Recommendations

In order to continue the COLAMDA concepts, these recommendations are offered:

1. That the Colorado Council of Mathematics teachers provide a clearinghouse for COLAMDA materials and serve as a vehicle for including COLAMDA under its auspices.

2. That the BOCS in surrounding Metropolitan Denver diligently seek ways to include COLAMDA concepts, materials, and administration in their care.

3. That the project administrator approach the CDE Title III office and ask that any funds not expended this year be given to COLAMDA for a longitudinal study to be completed and shared with all participating school districts.

4. That the COLAMDA project staff video tape some of the sharing concepts and in-service activities remaining in this project year for dissemination to State school district through CDE.

5. That the COLAMDA project staff establish on-going in-service workshops with the cooperation of the CDE for the coming year.

6. That the CDE Title III office consider placing more emphasis on action and advice concerning diffusion and dissemination early in Title III projects. This is suggested since most dissemination comes after the fact rather than being a continual process.

7. That more contact with the lay public is needed in order to disseminate the positive aspects of a project such as COLAMDA. Other projects of this size and depth should take heed.

GENERAL SUMMARY OF PROJECT

GENERAL SUMMARY OF PROJECT RESULTS

In 1968-69 the project teachers used various standardized tests (Stanford, CAT, ITBS, TAP. ITED) to measure student academic growth. During the last two years of project operation, the Stanford Achievement Test (advanced battery) was used to measure student academic growth. The following data scores are based on average grade placement scores of project students.

	Pre Tests	Post Tests	Gain	Time Between Tests
1968-69	6.44	7.12	.68	6 Months
1969-70	6.16	6.97	.81	6 Months
1970-71	5.87	6.68	.81	6 Months

During the first year (1968-69) the COLAMDA project administered pre and post student questionnaires to measure student attitude. Results of the questionnaires (see Appendix) indicated that student attitudes had changed in the positive direction on each item. (The most favorable changes occured on the following questions:)

1. I enjoy mathematics classes.
2. I enjoy working with the calculators.
3. I have enjoyed this mathematics class more than previous mathematics classes.
4. I feel more success in this mathematics class than in previous mathematics classes.
5. I feel I have learned more in this class than in previous mathematics classes.
6. I feel appropriate materials were used in this class.
7. I like the variety of activities used in this mathematics class.

8. I feel that the teacher understands me and my mathematical needs.

9. I enjoy working with the games and puzzles.

During the second year of project operation, a student semantic differential replaced the student questionnaire. This instrument measured student attitudes in the following areas: arithmetic, school, teacher aide, reading, my teacher, homework, laboratory, myself. It was clearly evident that student attitudes had changed significantly in the positive direction in all areas. (See Appendix, COLAMDA Analysis of 1969-70 Results).

In the third and final year of the COLAMDA Project, a student semantic differential was given measuring student attitudes in the following areas: arithmetic, my school, teacher aide, homework, mathematics laboratory, my mathematics teacher. The project results indicate little attitude change. (See Appendix.)

Both written and oral responses have indicated that students involved in the project did experience success and satisfaction with mathematics and other facets of school life.

During the last two years of the project (1969-70, 1970-71), the teachers were administered, pre and post, a semantic differential questionnaire. Teacher attitudes were measured in the following areas: mathematics, slow learners, mathematics laboratory, teacher aide, myself, COLAMDA, my principal, personalized instruction. It is interesting to note, that the COLAMDA teachers scored high in each area in the pre and post tests. This suggests that highly qualified and interested teachers were selected to guide the low achiever from the outset of the school year. By close observation and talking to many COLAMDA teachers and

administrators, I feel that participating COLAMDA teachers were some of the best teachers in their school districts. During the past three years I have received very little negative criticism about any phase of the project. At the same time, a significant amount of positive criticism has been given. This seems to indicate that the majority of COLAMDA teachers have found real dedication and enthusiasm in project participation. In all honesty, I feel this dedication and enthusiasm will prevail.

EFFECTS OF TEACHERS' PERSONALITY SYSTEMS, SUBJECT MATTER AND STUDENTS' PERSONALITY SYSTEMS ON TEACHER EVALUATION: A PRELIMINARY REPORT[1]

O.J. Harvey, Kathleen Wells, Curtis Schmidt, and Cathy Grimm

University of Colorado[2]

1. This study was carried out under partial support from COLAMDA. Our Thanks are extended to this project and to its administrators, especially Mr. Dan Colvin, for the support; to Dr. Joe Lasky for his assistance; to the principals who permitted the research to be carried out in their schools; to the trained observers for their conscientious efforts; and particularly to the teachers and students for their time and cooperation in supplying the data.

2. A more detailed report is being prepared which will be made available to COLAMDA and to the principals and teachers who participated in the study.

INTRODUCTION

It is a common observation that while a particular teacher may be quite effective with one kind of student, he or she may be as equally ineffective with another kind of student. The main purpose of this study was to investigate some of the determinants of this differential effectiveness. Of the many factors that doubtlessly relate to this, the focus of this study was on how teachers of different personality systems were evaluated by students of different personality systems. As a kind of control or yardstick against which to interpret the students' evaluations of their teachers, trained observers also observed and made ratings of the teachers on the same scale used by the students as well as on an additional scale used only by the observers.

More specifically, selected samples of junior high teachers of Social Science and Math in the COLAMDA Project who differed in the personality characteristic of concreteness-abstractness were rated by students differing on this same personality dimension and by trained observers on scales aimed at measuring certain aspects of classroom atmospheres and procedures. While the major concern was with COLAMDA teachers, Social Science teachers were included as a kind of control or comparison group, the appropriateness of which will become apparent later.

METHOD

Measurement of the Concreteness-Abstractness of Teachers' Personalities

Although two instruments were administered to the teachers for this purpose, the Conceptual Systems Test and the "This I Believe" Test, only the latter instrument (TIB) was used in this study for teacher personality classification.

The TIB, see Appendix, asks the respondent to indicate his or her beliefs about a number of referents of high personal meaning and involvement by writing

two or three sentences about his belief on that topic. From these completions, a respondent may be classified into one of four major personality systems or into admixtures of two or more systems.

System 1, the most concretely functioning of the four groups, is indicated by high dogmatic, pro-institution, pro-rules and pro-authority statements. System 2 is inferred from responses indicating equally high dogmatism and certainty together with strong negative statements a[redacted]e same topics toward which System 1 representatives made strong positive a[redacted]tions. System 3 is indicated by a strong emphasis upon the need for and desire to help the helpless and in the extolling of the merits of friendship, humanism and interpersonal understanding and harmony. System 4, the most abstract of the four groups, is reflected in greater openness, tolerance of viewpoints that differ from his own, a high task orientation and an ability to generate multiple approaches or solutions to a problem and to synthesize these into something new and creative.

Approximately 60 COLAMDA and 45 junior high school Social Science teachers, in groups of from five to twenty, were first administered the concreteness-abstractness tests, i.e. the TIB and CST. On the basis of their responses to one of these measures, 50 teachers, 25 each from COLAMDA and Social Science, were selected as the experimental sample. These 50 teachers were later rated by trained observers and/or students in their classes.

In the present study only fairly clear representatives of Systems 1, 3 and 4 teachers were rated. Within COLAMDA, the final or experimental sample of teachers consisted of eight System 1's, eight System 3's and seven System 4's. Within the experimental sample of Social Science teachers, eight represented System 1, seven System 3 and eight System 4. Approximately half of the experimental sample of both Social Science and COLAMDA teachers were rated by <u>both</u> the trained

observers and students while the other half was rated by students only.

Measurement of the Concreteness-Abstractness of Students' Personalities

Form A of the Conceptual Systems Test (CST), see Appendix, was used for this purpose. Since this test had never before been administered to respondents this young, it was factor analyzed before being used to classify students into personality systems on the basis of their responses to it. Factor analysis if this instrument in the past based on responses of mostly young adults has consistently yielded six factors, which have been termed: (1) Divine Fate Control, expressed in such items as "I believe that to attain my goals it is only necessary for me to live as God would have me live" and "There are some things which God will never permit man to know"; (2) Need for Structure-Order, indicated by such items as "I like to have a place for everything and everything in its place" and "I like to have my work organized and planned before beginning it"; (3) Need to Help People, inferred from such items as "I like for my friends to confide in me and tell me their troubles" and "I like to sympathize with my friends when they are hurt and sick"; (4) Need for People, consisting of such items as "I like to join clubs or social groups" and "I like to give lots of parties"; (5) Interpersonal Aggression, comprised of such items as "I feel like telling other people off when I disagree with them" and "I like to criticize people who are in a position of authority"; and (6) General Pessimism, containing such items as "These days a person doesn't really know whom he can count on" and "Anyone who completely trusts anyone else is asking for trouble."

A factor analysis of the responses of the slightly over 1000 students to whom the CST was administered in this study replicated the first five of the preceding factors, the only omission being General Pessimism. Presumably the junior high school students had not yet become sufficiently pessimistic and distrusting for this factor to show up.

Through a factor analytic method referred to as O-Typing by it authors (Tryon & Bailey, 1971), students were classified as Systems 1, 2, 3 or 4 on the basis of their scores on the five factors noted above. In general, a student was classified as System 1 if his scores on both Divine Fate Control and Need for Structure-Order were at least one standard deviation above the mean. He was classified as System 2 if he scored at least one standard deviation below the mean on Divine Fate Control and at least one standard deviation above the mean on Interpersonal Aggression. He was categorized as System 3 if his score on Divine Fate control was around the mean, his scores on both the Need to Help People and Need for People were at least one standard deviation above the mean and his score on Interpersonal Aggression was at least one standard deviation below the mean. A student was classified as System 4 if his score on Divine Fate Control, Need for Structure-Order, Need for People and Interpersonal Aggression was less than one standard deviation above or below the mean.

Teacher Rating Scales

Teachers were rated on two scales which shall be labeled Student Rate Teacher Scale (SRT) and Observer Rate Teacher Scale (ORT). The SRT, on which both students and trained observers rated the teachers, was an 80-item scale which was used for the first time in this study and a copy of which is included as Attachment 3. The ORT, on which only trained observers rated the teachers, is a 21-item scale which has been used successfully in several of our previous studies (e.g., Harvey, White, Prather, Alter & Hoffmeister, 1966; Harvey, Prather, White & Hoffmeister, 1968), a copy of it is included as Attachment 4. The ORT, like the CST noted earlier, has been factor analyzed several times previously and has yielded consistently two factors, Dictatorialness and Fostering Exploration.

The SRT was factor analyzed for the first time in this study. Five factors were yielded: (1) Student Respect, (2) Destructiveness, (3) Favoritism, (4) Dictatorialness and (5) Fostering Independence. The items entering into each

of these factors are indicated in the Appendix by the abbreviations R, D, F, Di and FI for Student Respect, Destructiveness, Favoritism, Dictatorialness and Fostering Independence respectively.

RESULTS

Observer Rate Teacher Scale

The mean ratings of teachers of Systems 1, 3 and 4 in both COLAMDA and Social Studies made by the trained observers are presented in Table I. A

TABLE I

Mean ratings of Systems 1, 3, and 4 teachers on the two ORT factors made by trained observers.

ORT Factor	System 1 teachers		System 3 teachers		System 4 teachers	
	COLAMDA	Soc. Sc.	COLAMDA	Soc. Sc.	COLAMDA	Soc. Sc.
Dictatorialness	2.98	3.45	2.03	2.69	1.84	1.72
Fostering Exploration	2.72	2.76	3.68	3.11	4.02	4.27

two-way analysis of variance (System of teacher-subject taught) of these data showed there was no significant difference between how COLAMDA and Social Science teachers were rated by the observers on either the factor of Dictatorialness or Fostering Exploration. However, the personality system of the teacher did significantly affect how he or she was evaluated by the observers. Both systems 3 and 4 teachers, especially System 4, were seen as being less dictatorial and as fostering greater exploration than System 1 teachers.

Student Rate Teacher Scale

Observers' Ratings of Teachers on SRT

The mean ratings of the teachers made by the trained observers on the five factors derived from this scale are presented in Table II. A two-way analysis

TABLE II

Mean ratings of System 1, 3, and 4, teachers on the five SRT factors made by trained observers.

SRT Factor	System 1 teachers		System 3 teachers		System 4 teachers	
	COLAMDA	Soc. Sc.	COLAMDA	Soc. Sc.	COLAMDA	Soc. Sc.
Student Respect	3.26	2.56	3.89	3.56	4.14	3.98
Destructiveness	2.23	2.81	1.61	1.81	1.35	1.77
Favoritism	2.81	2.81	2.25	2.08	1.89	2.25
Dictatorialness	2.30	2.88	1.61	1.68	1.47	1.62
Fostering Independence	3.12	4.21	3.94	3.78	4.05	2.50

of variance (system of teacher-subject matter) of these data yielded results quite parallel to those noted above for the ORT. On none of the five factors were COLAMDA and Social Science teachers rated significantly differently by the trained observers, although as may be noted from Table II there was a slight tendency for the COLAMDA teachers to be rated slightly more favorably.

The personality system of the teachers, as on the ORT, did significantly affect how they were rated by the observers on all of the five factors except Favoritism. In comparison to System 1 teachers, Systems 3 and 4 teachers, especially the latter, were rated by the observers as showing greater respect for the students, as being less destructive and dictatorial and as fostering greater independence among the students. Again COLAMDA teachers were rated slightly more favorably by the observers than were the Social Science teachers, indicating possibly that the experiences in COLAMDA had positively influenced the teachers in that program. This possibility gains added weight from the ratings made of the teachers by the students.

Students' Ratings of Teachers on SRT

Table III presents the mean ratings of Systems 1, 3 and 4 teachers in both COLAMDA and Social Science made by the students on the SRT factors. It should be

noted that these means are without regard to the personality system of the students.

A comparison between Tables II and III shows that students differed from the

TABLE III

Mean ratings of System 1, 3 and 4 COLAMDA and Social Science teachers on the five SRT factors, made by trained observers.

	Student Respect		Destructiveness		Favoritism		Dictatorialness		Fost.	Indep.
Teacher System	COLAMDA	Soc.	COLAMDA	Soc.	COLAM	Soc	COLAMDA	Soc.	COLAM	Soc.
1	3.55	3.34	2.20	2.12	3.19	2.97	2.51	2.48	3.73	3.45
3	4.02	3.35	1.76	2.23	2.66	3.36	1.81	2.43	4.08	3.57
4	3.26	3.72	2.28	1.48	3.14	3.72	2.74	2.13	3.46	3.81

trained observers in how they rated teachers of the different personality systems. A three-way analysis of variance (system of teacher, subject matter and system of student) showed that on three of the five SRT factors, Respect, Dictatorialness and Fostering Independence, the personality of the teacher significantly influenced the way she was rated by the students. But unlike the ratings of trained observers, on which System 4 teachers attained the highest scores, System 3 teachers were rated most positively on these three factors by the students.

It should be noted also that on two of the five SRT factors, Respect for Students and Fostering Independence, COLAMDA teachers were rated significantly higher than were the Social Science teachers. On none of the other three SRT factors did the subject matter being taught affect how the teacher was rated by the students.

The interaction between the personality system of the teacher and the subject taught (Math or Social Science) yielded some interesting and consistent results. On all five of the SRT factors this interaction significantly influenced the students' ratings of the teachers. This was accounted for by the fact, as may be observed from Table III, that within the COLAMDA sample System 3 teachers

were rated the most positively of the three systems by the students while in Social Science, System 4 teachers were consistently rated most positively by the students.

The higher ratings of System 3 COLAMDA teachers is consistent with our theoretical expectancies. The fact that COLAMDA students definition were low achievers and thus could be perceived as being in need of special help presumably elicited the helping orientation in System 3 teachers to a greater extent than in System 1 and 4 teachers with the result that System 3 teachers were perceived more positively by COLAMDA students. Among the Social Science students, who were not defined as needing special help, System 4 and not System 3 teachers were rated most positively by the students. It is possible that the latter finding would also obtain for Math in those classes not defined as needing special assistance, something that will be tested in a future study.

We expected that the personality systems of the students and teachers would interact so that teachers of different systems would be evaluated differently by students of different systems. To our surprise, the analyses of variance showed this not to be the case for any of the five SRT factors.

With the personality of the teacher disregarded, however, the personalities of the students did significantly influence the way they rated the teachers on two of the five SRT factors, Destructiveness and Dictatorialness. As may be noted from Table IV, System 2 students rated their teachers as being more destructive

TABLE IV

Mean ratings of teachers (without regard to their personalities) on the five SRT factors, made by students of Personality Systems 1, 2, 3 and 4.

Student Personality System	S R T FACTORS				
	Student Respect	Destructiveness	Favoritism	Dictatorialness	Fost.Indep.
1	3.54	1.95	2.96	2.30	3.77
2	3.48	2.29	3.25	2.55	3.63
3	3.61	1.92	2.90	2.29	2.72
4	3.54	2.04	2.91	2.26	3.61

and dictatorial than did students of other systems. This is in line with general System 2 functioning in which representatives of this system tend to be more distrusting, negative and critical toward authority than individuals of other systems.

SUMMARY

1. In line with our previous studies, the trained observers, on both the Student Rate Teacher and Observer Rate Teacher Scales, evaluated the System 4 teacher as providing a more desirable classroom atmosphere than teachers of either systems 1 or 3, especially 1.

2. Trained observers tended to rate COLAMDA teachers slightly, but not significantly, more positively on most of the factors than Social Science teachers.

3. COLAMDA students quite consistently rated System 3 teachers more positively than teachers of either Systems 1 or 4 while Social Science students tended to rate System 4 teachers the most positively.

4. System 2 students tended to rate teachers more unfavorably than students of other systems.

5. To our surprise, the ratings students made of teacher of different personality systems were not affected by their own personality.

Finding 3 above may be of special importance. It suggests that System 3 teachers, at least from the students' perspective, may be more effective for students defined as needing special help than for students not needing this assistance. The reverse appears to be the case for System 4 teachers. This study, of course, does not answer this. In order to do so, we would want to study teachers of different systems teaching Social Science and Math (plus other courses perhaps) with half of the classes in each being of students classified as needing special help and the other half as not.

APPENDIX

APPENDIX

Page Number

COLAMDA ANALYSIS OF 1968-69 RESULTS

Student Questionnaire 33

Student Standardized Achievement Test Results 36

COLAMDA ANALYSIS OF 1969-70 RESULTS

Achievement Data 40

Achievement Test Results (Table I) 41

Grades in Subject Areas (Table II) 42

Attitudes 43

Semantic Differential Scores (Table III) 44

Summary 45

COLAMDA ANALYSIS OF 1970-71 RESULTS

Objectives 48

Workshop Questionnaire 48

Workshop Summary 50

Classroom Information 51

Material Usage 52

COLAMDA Material Questionnaire 52

Teacher Questionnaire 62

Student Questionnaire 64

Student Performance 65

Summary for Objective One 67

Administrator Interview 68

Page Number

College Teacher Response 69

Letter One 70

Letter Two 70

Letter Three 71

Letter Four 72

Letter Five 72

Summary for Objective Three 73

General Summary 73

EFFECTS OF TEACHERS' PERSONALITY SYSTEMS, SUBJECT MATTER AND STUDENTS PERSONALITY SYSTEMS OF TEACHER EVALUATION

TIB Opinion Survey 76

Personal Opinion Scale 78

Teacher Rating Scale 1 79

Teacher Rating Scale 2 83

COLAMDA ANALYSIS OF 1968-69 RESULTS

1968-69

STUDENT QUESTIONNAIRE

This questionnaire is related to your mathematics class. Check the appropriate place for each item.

	Strongly Agree		Agree		No Opinion		Disagree		Strongly Disagree	
1. I enjoy mathematics classes. Comment:	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	45	88	249	231	65	57	73	29	23	16
2. I feel working with flow charts has helped me understand some mathematical concepts. Comment:	8	16	40	67	387	218	13	33	1	7
3. I enjoyed working with the calculators. Comment:	14	131	44	89	362	114	21	10	1	8
4. I have enjoyed this mathematics class more than previous mathematics classes. Comment:	54	170	141	163	140	57	43	30	23	9
5. I feel more success in this mathematics class than in previous mathematics classes. Comment:	60	163	163	159	180	58	37	36	13	13
6. Participation in this class has given me a more positive attitude toward school. Comment:	31	65	127	152	229	141	50	47	12	23
7. I feel I have learned more in this mathematics class than in previous mathematics classes. Comment:	40	146	97	161	255	63	47	42	14	15
8. I feel my classmates are learning more in this mathematics class than in previous mathematics classes. Comment:	26	50	88	131	289	186	36	34	11	24

	Strongly Agree		Agree		No Opinion		Disagree		Strongly Disagree	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
9. I have completed my required work for this mathematics class. Comment:	29	82	123	183	253	95	47	59	13	7
10. I ask questions when I don't understand certain concepts and ideas. Comment:	103	94	238	196	70	44	51	73	3	8
11. I feel appropriate materials were used in this class. Comment:	37	123	145	197	254	73	24	21	10	10
12. I like the variety of activities used in this mathematics class. Comment:	50	146	160	171	208	69	37	23	18	14
13. I feel that the teacher understands me and my mathematical needs. Comment:	70	147	141	163	198	77	40	20	15	17
14. I feel that the "real-life" mathematical problems introduced in this class will help me when I complete high school. Comment:	68	111	194	174	199	111	20	20	9	26
15. I enjoyed being able to use the resource center. Comment:	21	59	66	102	336	176	11	15	4	13
16. I enjoyed working with the experiments. Comment:	37	87	110	97	290	157	20	15	15	9
17. I enjoyed working with the games and puzzles. Comment:	59	169	118	126	250	44	26	18	17	10

	Strongly Agree		Agree		No Opinion		Disagree		Strongly Disagree	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
18. I enjoyed working with materials, other than games, in the resource center. Comment:	26	86	98	128	300	143	24	15	9	13
19. I have learned a lot from the field trips. Comment:	30	7	27	12	355	271	19	11	8	35

1968-69 ACHIEVEMENT TEST SCORES

Pre-Test administered - October, 1968
Post-Test administered - April, 1969

Grade	# Pre-Tested	School	District	Teacher	Test
7	34	North Brighton Junior High	Brighton (Adams 27J	R. Justice	Stanford
8	15	Northglenn Junior High	Eastlake (Adams 12)	J. Smith	Standard
8	26	Northglenn Junior High	Eastlake (Adams 12)	J. Smith (Control)	Standard
9	17	Adams City Junior High	Adams City (Adams 14)	Heller - Swanson	CAT
9	21	Sheridan Junior High	Sheridan (Arapahoe 2)	R. Green	ITBS
9	21	Drake Junior High	Jefferson County R 1	C. Magtutu	ITBS
9	33	Sinclair Junior High	Englewood (Arapahoe 1)	P. Koury	CAT
9	17	Flood Junior High	Englewood (Arapahoe 1)	L. Grogan,	Standard
9	27	Flood Junior High	Englewood (Arapahoe 1)	L. Grogan (Control)	Standard
9-10	29	Mapleton High	Mapleton (Adams 1)	W. Dingwall	Standard
9	27	Douglas County Junior High	Douglas County Re 1	G. Brink	ITBS
9	29	Douglas County Junior High	Douglas County Re 1	G. Brink (Control)	ITBS
9		Euclid Junior High	Littleton (Arapahoe 6)	M. Simmons	CAT

1968-69 ACHIEVEMENT TEST SCORES

Pre-Test Grade Placement					Post-Test Grade Placement				
Mean	Mode	Median	Low	High	Mean	Mode	Median	Low	High
4.5	4.3	4.4	2.5	6.0	4.8	5.1	4.8	3.7	6.0
4.6	5.6	5.1	2.6	6.0	5.6	6.0 6.4	5.8	3.6	6.8
6.0	6.6	6.2	2.6	7.8	6.7	6.6	6.6	3.9	8.6
6.5	6.5	6.5	5.0	7.0	7.3	6.8 8.6	7.3	5.2	9.3
6.5	6.5	6.5	5.0	7.4	6.8	6.8	6.8	4.6	9.0
6.7	6.8	6.8	5.6	8.4	7.2	6.2 8.0	6.8	4.5	9.7
8.1	8.0 8.1 9.3	8.1	6.2	9.7	8.9	9.3	9.1	5.9	10.9
6.0	6.2	6.2	5.1	6.8	6.9	7.0 7.2	7.0	5.7	8.9
6.9	5.8	6.9	4.2	10.2	7.9	6.5	7.6	5.3	11.-
6.5	6.6	6.4	5.7	9.0	7.0	6.1;6.5 6.6;7.0 7.5	6.95	6.0	9.0
7.4	7.5	7.1	5.4	9.3	7.7	8.3	8.2	6.0	9.8
7.2	6.6 7.7 8.6	7.0	5.5	8.6	8.0	7.0	7.9	6.0	9.8
6.8	7.5	7.4	5.6	9.4	7.8	7.4	7.6	6.2	10.3

1968-69 ACHIEVEMENT TEST SCORES

Change In Grade Placement

Mean	Gain	Gain	Tested Pre & Post	# Mo.
.3	1.9	- .4	10	
1.0	2.3	- 1.7	3	
.7	2.5	- .6	3	
.8	2.1	- 1.2	2	
.3	2.0	- 2.0	1	
.5	2.7	- 1.8	4	
.8	2.6	- .6	6	
.9	2.2	- .4	1	
1.0	1.4	- .5	6	
.5	2.1	- .3	19	
.3	3.2	- 1.3	8	
.8	2.3	- .7	7	
1.0	2.6	- .3	22	

COLAMDA Analysis of 1969-70 Results

By Dr. Doug Sjogren

COLAMDA

Additional Analysis of 69-70 Results

Douglas Sjogren (1-71)

The publication entitled Report on Evaluation of Colamda Project: 1969-1970 contains a description of the project as it was conducted in 1969-1970 along with a presentation of the evaluative data. This paper is essentially an addendum to the 1969-1970 report in that it presents some additional analyses of the 1969-1970 data.

Achievement Data

The evaluation design called for the administration of the Stanford Achievement Test to a random sample of 150 students in the project on a pre-post basis. Some difficulty was encountered in carrying out this design and complete pre-post data were obtained from only 95 of the students. The sample was decimated by factors such as mobility, drop-outs, and inadequate control of the design.

The Stanford Achievement Test yields scores in three areas of mathematics achievement: Application, Knowledge of Concepts, and Computation. The pre-tests were administered in October, 1969, and the post-tests in April, 1970. The typical period between pre-test and post-test was about 6 months or .5 of a year. The data were analyzed separately for the high school and junior high school students. The correlated t-test model was used for analyzing the data. Because the logical prediction was of a gain, the one-tailed null hypothesis served as the statistical hypothesis. The scores used in the analysis were the grade placements.

TABLE I

Achievement Test Results

High School Students
(N = 44)

	$\bar{X}$	S.D.	r	Difference	t	prob.
Applications pre-test	6.91	1.79	.707	.45	2.14	<.025
Applications post-test	7.36	1.86				
Concepts pre-test	6.65	1.67	.728	.81	4.50	<.01
Concepts post-test	7.46	1.49				
Computation pre-test	6.39	1.59	.477	.97	4.22	<.01
Computation post-test	7.36	1.24				

Junior High Students
(N = 51)

Applications pre-test	5.00	1.22	.472	1.18	5.90	<.01
Applications post-test	6.18	1.47				
Concepts pre-test	5.75	1.11	.611	.60	3.53	<.01
Concepts post-test	6.35	1.49				
Computation pre-test	6.26	1.60	.568	.85	3.86	<.01
Computation post-test	7.11	1.63				

The results presented in Table I indicate a statistically significant gain in mean grade placement on each of the tests at both the junior and senior high school levels. Furthermore, the gain exceeded the .5 year gap between testing except for the applications test at the senior high level. On the basis of past performance of these groups one would expect a gain over the six-months period of something less than .5 year. A reasonable conclusion is that the program had a significant beneficial effect on the math achievement of these students.

There are at least two alternative hypotheses, however. Some gains would be expected on the basis of maturation. As argued above, however, the

past performance of these students in math was such that the magnitude of gain obtained here would not have been attained by maturation. A second possible explanation for the results is the regression effect. The unreliability of the tests is such that a change toward the mean of the population would occur with any retest. This group is a group of low-achievers and as such the regression effect would cause them to have a higher mean on a retest. The regression effect is lessened in this situation, however, in that the students were not selected on the basis of their scores on the pre-test. Thus the random error did operate to both increase and decrease scores. What regression effect is present is difficult to ascertain but it is probably not large.

With the limitations of the data in mind, it would appear that the program did have a beneficial effect for these students.

There is an interesting pattern in the results. The data suggest that the high school students had less relative gain in the application area than the junior high school student, but more relative gain in concepts and computation. This result bears further study in terms of the materials and methods used at the two levels.

TABLE 2

Grades in Subject Areas

	High School			Jr. High School		
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.
English	28	1.86	.83	26	1.85	.75
Social Studies	25	1.64	1.09	23	1.61	1.20
Science	19	1.84	.99	18	1.78	.95
Mathematics	29	2.66	.71	27	2.67	.52
Other	29	2.17	.79	27	2.15	.65

End-of-year grades were available for some of the students, and the average grades by subject area are presented in Table 2. The mathematic grades are higher than the grades in other areas. These data give some indication that the students performed at a higher level in math than in the other subjects. The relative nature of grades is recognized, however, and it may be that the differences only reflect that these generally low-achieving students were competing with better students in other subjects. The data in Table 2 should also cause some worry about the question of whether any higher math achievement was at the expense of achievement in other subjects.

Attitudes

Changes in feelings about various things were measured with an adaptation of the semantic differential technique. The semantic differentials were administered on a pre-post basis to the sample used in the achievement study. Complete data are available on only 55 of the students.

The concepts that were judged are shown in Table 3. Each concept was judged on 15 seven point, bi-polar adjective scales. The scales are presented in the original report. An arbitrary decision was made for scoring the scales and a seven was the score assigned to the adjective that was judged to be favorable and a one to the adjective judged unfavorable. A subject's score for a concept was the mean rating across the 15 scales. A high score was indicative of a favorable attitude and a low score unfavorable. The arbitrariness of the scoring procedure reduces confidence in the validity of the scores. The data in Table 3, however, are such to increase confidence that the scoring procedure did result in scores that were measures of some attitude.

TABLE 3

Semantic Differential Scores

High School Subjects
(N = 30)

	Pretest		Posttest				
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	r	t	prob.
My Teacher	4.79	.69	5.58	1.20	.45	4.16	<.01
My Self	4.44	.91	4.90	1.11	.48	2.42	<.025
Laboratory	4.54	.73	4.84	1.18	.09	1.25	n.s.
School	4.54	.92	5.35	1.11	.34	3.68	<.01
Teacher Aides	4.37	.79	5.33	1.11	.16	4.17	<.01
Homework	4.34	.74	4.64	1.22	.14	1.20	n.s.
Arithmetic	4.67	.82	5.53	1.00	.38	4.78	<.01
Reading	4.27	1.10	5.05	1.19	.13	2.78	<.01

Junior High School Subjects
(N = 36)

My Teacher	4.55	.60	5.82	.86	.20	7.94	<.01
My Self	4.30	.66	5.07	1.19	.29	3.85	<.01
Laboratory	4.52	.62	5.00	.99	.18	2.53	<.01
School	4.63	.68	5.26	1.26	.42	3.32	<.01
Teacher Aides	4.24	.76	5.33	1.04	.07	5.19	<.01
Homework	4.22	.75	4.95	1.03	.34	4.05	<.01
Arithmetic	4.84	.83	5.52	.88	.32	4.00	<.01
Reading	4.61	.80	4.93	.96	.22	1.78	<.05

Generally the attitudes toward the concepts in both groups showed significant changes in the desired direction. The high school subjects had somewhat smaller changes but there greater age would make it likely that their attitudes would be more set than the junior high students. The data certainly suggest that the experience had the desired effect on attitudes at least in the available sample.

One result of interest is the consistent increase in the variability from pretest to post-test on all concepts. The reason for this result is not apparent but may merit further investigation.

Correlations were computed between each of the achievement and attitude variables. Expected significant relationships were obtained between the achievement variables, but there were few statistically significant relationships between the attitude and achievement variables or among the attitudinal variables. The number of significant correlations was about what would have been expected by chance except for the relationships among the achievement variables.

Teachers

An attempt was made to determine whether the attitudes of the project teachers toward certain educational concepts changed during the year. A semantic differential type exercise was completed on a pre-post basis by 23 of the teachers. They evaluated the following concepts: mathematics, learning, others, self, reading, experiment, textbook, discipline, teaching, lecutre and laboratory. The teachers' responses were scored in the same manner as described above for the students.

There were no significant changes in the means on any of the concepts, in fact there was a remarkable consistency or stability of the means. Thus, it would appear that the experience did not have a significant effect on teacher attitudes toward these concepts.

Summary

The analysis of the data suggest the following conclusions:

1. There was a significant change in performance on the Stanford Achievement Test in the desired direction in the sample and likely in the total group. Furthermore, this change was greater than one would expect on the basis of past performance or regression.

2. There was a significant change in feelings about certain relevant educational concepts and the changes were in the desired directions. It would appear that the project experience was generally positive, although there was an increased variability in the feelings which might suggest that several were not affected in the desired way.

3. The project experience apparently had little or no effect on teacher feelings about certain relevant educational concepts.

4. The students on whom there was complete pre-post data had means on the pre-test that were nearly the same as those of the students with pre-test scores only. This was true on both the achievement and semantic differential scores. This result gives further confidence that the results of these analyses are generalizable beyond the sample and are not an artifact of a select group.

Analysis of 1970-71 COLAMDA Project

By Dr. Doug Sjogren

Evaluation Report
COLAMDA Project
June 1971
Douglas Sjogren

This report presents analysis and discussion of the data and information collected about the COLAMDA project during the 1970-71 school year. Hopefully, this information will permit judgments about the project to be made with a greater degree of confidence than if no systematic information were available.

The content of the report is organized around two of the three general objectives of the project this year. The three objectives were:

1. To have identified effective procedures for implementation of a realistic personalized instruction concept.

2. To have identified desirable prevalent characteristics of effective teachers instructing low achievers in the participating school districts.

3. To have identified an effective diffusion model for continuation and expansion of project objectives in participating districts.

This report contains information of relevance to objectives one and three. Objective two was the focus of a separate study.

Objective One

The data of relevance to the first objective are from the following sources:

1. Responses to a questionnaire given to summer workshop participants.

2. Observations of teacher performance.

3. Indications of material usage.

4. Responses to a teacher questionnaire administered in March.

5. Teacher attitudes form.

6. Student attitude form.

7. Student performance data

Workshop questionnaire - During the summer of 1970, there were five workshops held by COLAMDA for teachers who were to be involved in the project during the 70-71 year. A total of 117 teachers participated in the workshops, all but about 20 of the teachers who were with the project in 70-71. The exact number of participating teachers is difficult to pinpoint because of assignment changes, resignations, etc. Data were available on 133 separate teachers from some source during the year.

The workshops were generally seven days in length although some teachers participated for only three days. Most of the three-day participants were teachers who had worked with COLAMDA in previous years.

The workshop time was spent in learning about the materials and techniques of COLAMDA. A considerable amount of time was spent constructing the materials. Some teachers commented that too much time was given to this activity and not enough time was devoted to the use of the materials.

The following table presents the results of a questionnaire administered at the completion of the workshops. The figures are the percent of persons responding in each category.

1. During the workshop I gathered new ideas which I will use in my classroom.

YES	Yes	yes	NO	No	no	No Response
67	22	9	1	1	1	0

2. The length of time spent in the workshop was:

Excessive	Adequate	Inadequate	No Response
2	88	9	1

3. The quality of instruction was:

Good	Fair	Poor	No Response
82	13	1	4

4. The amount of instruction was:

Good	Fair	Poor	No Response
60	34	1	5

5. The organization of the workshop was:

Good	Fair	Poor	No Response
67	26	1	6

6a. The contributions of resource personnel were:

Good	Fair	Poor	No Response
39	31	24	6

6b. The contributions of others were:

Good	Fair	Poor	No Response
73	17	1	9

7. The quality of topics covered during the workshop was:

Good	Fair	Poor	No Response
78	19	0	3

8. The number of topics covered during the workshop was:

Excessive	Adequate	Inadequate	No Response
1	67	28	4

9. The quality of material received was:

Good	Fair	Poor	No Response
93	6	0	1

10. The quantity of material received was:

Excessive	Adequate	Too little	No Response
17	76	7	0

11. The organization of the material received was:

Good	Fair	Poor	No Response
83	15	1	1

12. The quality of COLAMDA philosophy was:

Good	Fair	Poor	No Response
77	17	1	5

13. The quantity of COLAMDA philosophy given during the workshop was:

Good	Fair	Poor	No Response
56	37	1	6

14. My attitude toward the low achiever before participating was:

Strong favor	Favor	Dislike (for the low achiever)	Strong dislike	No Response
28	46	19	1	6

15. My attitude toward the low achiever after participation is:

Strong favor	Favor	Dislike (for the low achiever)	Strong dislike	No Response
43	48	3	0	6

The results on the questionnaire and the free responses of the participants indicate that the workshops were quite effective in orienting the teachers to COLAMDA. They felt they received many ideas and materials. There is some evidence that some teachers did not completely absorb the COLAMDA philosophy, which is somewhat evident in other data. The participants as a group were quite negative in their feelings about the college consultants.

Classroom Information

The workshops seem to have been rather effective in preparing the teachers for using the COLAMDA materials and techniques. The next question is whether they were used. Some data are available on this question.

During January and February a sample of 36 teachers were observed by project staff. The observation forms provided data on whether COLAMDA materials were used and whether there was a laboratory situation. The writer of this report also made a rating of the teachers' effectiveness with low-achievers from the observation protocal.

With respect to use of COLAMDA materials the following ratings were obtained:

Extensive use - 13
Some use - 15
Little or no use - 8

The ratings on the lab environment were:

Good lab - 8
Fair lab - 9
No lab - 15

Overall ratings were highly related to the above ratings and were as follows:

High - 13
Average - 13
Low - 10

These data indicate that the COLAMDA techniques and materials were used quite extensively in a majority of the classrooms. There is evidence, however, that a sizable portion of the teachers did not really implement the COLAMDA project in their classroom.

On a questionnaire administered in a March in-service meeting the teachers were asked to indicate perceived weaknesses of the COLAMDA project. Their responses to this question provide some clues to why the project was not well-implemented in some situations. There was some indication that the workshops did not develop mastery of material usage. This was reflected by comments like "the materials are not well-organized", "there are too many materials", and "too much emphasis on making materials in the workshop, not enough on use". Another group of comments suggested lack of support from the school or from the project staff. Such comments were like "no financial support for labs and materials", "administration doesn't know what it is (just toys)", "need more meetings to exchange ideas", and "the project staff is spread too thin".

Most of the teachers apparently did make effective use of COLAMDA equipment and materials. It is quite clear, however, that a one-week workshop with only limited follow-up will not effect dramatic changes in the behavior of many teachers.

Material Usage - There is a large amount of materials in the COLAMDA kit. Certainly the kit is a tremendous resource. It was felt desirable to get information on the extent to which the materials were used by the teachers. A count from every teacher would have been an impossible burden for the teacher. The following procedure was used to obtain information on material usage.

A listing of the materials in the COLAMDA kit was made. There were 339 separate sets. The list was arranged into 13 sets of 25 and one set of 14. These were arranged into 14 forms on which the teacher was asked to indicate for each item how many students used the materials and a rating of the reaction to the materials. Each teacher was asked to respond on only one of the forms. The forms were returned by 63 teachers. The following table contains the tabulation of the responses to each form. The N is the number of teachers who returned the completed form. The data do provide an indication of which materials were used extensively and were liked. This information should be helpful for teachers considering use of the kit and for revising the kit. The writer does not know why the returns differed by form nor why the response rate seems to be less on the higher-numbered forms. Supposedly an equal number of teachers received each form.

In view of the fact that there were many materials in the COLAMDA kit, there was one rather revealing comment regarding the limited imagination of some teachers in using them. This comment was that the students complained because they were using things that had been used before!

COLAMDA MATERIAL QUESTIONNAIRE

PLEASE RESPOND TO COLAMDA materials that you have used in your classroom and/or have some feeling about. Mark the space according to the students involvement and how well you liked the material. (Place mark in the most appropriate space.)

Form 1 -- (N=9)

Students involved						Reactions				
0-10%	11-25%	26-50%	51-75%	76-100%		Dislike 1	2	3	4	Like 5
1	0	0	2	6	A-1 #1-Graphing Pictures	0	0	2	4	3
0	1	0	1	7	A-2, A-3, A-4-Guided Mazes	0	0	0	6	3
3	0	0	0	2	A-5-Amazing	0	0	2	0	1
3	0	0	0	2	A-6-Challenge	0	1	1	1	1
2	0	1	1	1	A-7-Volume	0	0	2	1	2
0	1	0	2	6	A-8- #1-3-Common Fractions	0	0	3	3	1
0	0	0	0	3	A-9-Ordered Pairs from Graphed Pictures	0	0	0	1	2
0	0	0	0	3	A-10-Line Design	0	0	0	1	2
1	0	0	0	0	A-11-Big Dallas Drags	0	0	0	0	0
0	0	0	0	4	A-12-How Far To School	0	0	0	1	2
0	0	0	0	4	A-13-#1-2-Find The Way	0	0	0	2	2
1	0	0	1	0	A-14--Do You Really Save	0	0	0	1	1
1	0	0	1	0	A-15--Buying Cars-Analyzing Bargains	0	0	0	1	0

STUDENTS INVOLVED						REACTIONS				
0- 10%	11- 25%	26- 50%	51- 75%	76- 100%		Dislike 1	2	3	4	Like 5
0	0	0	1	4	A-16--Lattic Mathematics	0	0	0	2	3
0	0	1	1	3	A-17--Magic Squares	0	0	1	1	2
1	1	1	1	0	A-18--Recipes	0	0	0	2	1
0	1	1	2	2	A-19--Divisor Tables	0	1	2	3	0
1	0	0	0	1	A-20--Time Payments	0	1	0	0	1
0	0	1	1	6	A-21--Whole Number Circle Puzzles	0	0	1	2	5
0	1	0	1	2	A-22--Add-A-Box	0	0	2	1	1
1	0	0	0	3	A-23--Add-A-Square	0	0	0	3	0
0	1	1	0	2	A-24--Something Left Over	0	0	1	2	0
0	0	2	1	0	A-25--A Rounded Decimal	0	0	3	0	0
0	0	0	0	3	A-26--Football/Game/Concession/Stand	0	0	1	2	0
0	0	0	1	4	A-27--Ordering Fractions	0	0	1	4	0
					Form 2 - (N=6)					
0	0	1	0	2	A-28--Comparison of Decimal Numbers	0	0	0	3	0
1	0	0	3	1	A-29--Ruler Addition of Fractions	0	0	1	2	1
1	0	1	0	2	A-30--Measure It	0	0	1	2	0
0	0	1	0	3	A-31--Fractions and Decimals	0	0	1	2	1
1	0	1	0	1	A-32--Decimals to Fractions	0	0	1	1	1
0	0	1	0	2	A-33--Ordering Fractional Parts	0	0	1	2	0
1	0	0	1	1	A-34--Graphing Pictures	0	0	1	1	0
0	0	1	3	2	A-35--Cross Number Puzzles	0	0	2	4	0
0	0	1	1	1	A-36--Decimal	0	0	1	1	1
1	0	1	0	1	A-37--#1-4--Fun With Decimals	0	0	1	1	0
0	0	0	0	2	A-38--Earth Fax	0	1	0	1	0
1	0	0	1	1	A-39--Did You Know?	0	0	1	0	1
1	0	1	1	0	A-40--Percents	0	0	2	0	0
0	1	0	0	3	A-41--Did You Know The Way?	0	0	0	2	2
0	0	1	0	0	A-42--What's In A Name?	0	1	0	0	0
1	0	0	0	0	A-43--A Bunch	0	0	0	1	0
0	1	0	1	2	A-44--Reading Concentration Test	0	0	0	2	2
1	0	1	1	1	A-45--Ratio-Proportion	0	0	1	1	1
0	0	0	2	1	A-46--Patterns and Predictions	0	0	1	2	1
1	0	0	0	0	A-47--#1-4--Math Patterns	0	0	0	0	0
1	0	0	0	0	A-48--Decoding	0	0	0	0	0
0	1	0	0	1	B-1--Puzzle--Blockbuster	0	0	0	1	1
0	0	1	0	0	B-2--Puzzle--Wachamukovski	0	0	0	1	0
0	0	0	2	1	B-3--Illusions	0	0	1	2	0
0	0	0	0	1	B-4--Fractional Overlays	0	0	0	1	0

STUDENTS INVOLVED						REACTIONS				
0- 10%	11- 25%	26- 50%	51- 75%	76- 100%		Dislike 1	2	3	4	Like 5
					Form 3 - (N = 7)					
0	2	0	0	0	B-5--Strike Strike	0	0	1	1	0
0	0	0	0	1	B-6--Puzzlers	0	0	0	1	1
0	0	0	2	1	B-7--Furnish Your Room	0	0	0	0	2
0	0	0	0	0	B-8--Use of Calculator to Add	0	0	0	0	0
0	0	0	1	0	B-9--Fix-It-Fast	0	0	0	1	0
0	0	0	1	0	B-10--Landscape	0	0	1	0	0
0	0	0	0	0	B-11--Construction Bid #1	0	0	0	0	0
0	0	0	0	0	B-12--Construction Bid #2	0	0	0	0	0
0	0	0	0	1	B-13--Rapid Calculation	0	0	0	0	1
0	0	0	0	0	B-14--Construction Bid #3	0	0	0	0	0
0	0	0	0	0	B-15--Construction Bid #4	0	0	0	0	0
0	0	0	2	2	B-16--Banking	0	0	0	1	3
0	0	0	1	0	B-17--NASA Apollo Mission	0	0	0	1	0
0	0	0	0	7	C-1--Tangrams	0	0	0	2	5
0	0	0	0	0	C-2--Lab - Heavyweight	0	0	0	0	0
0	0	0	3	1	C-3--#1-2--Geo Puzzles Group Two	0	0	0	3	1
0	0	0	0	2	C-4--Two Squares Puzzle #1	0	0	0	0	2
0	0	0	0	0	C-5--Scientific Slide	0	0	0	0	0
0	0	1	0	2	C-6--Fractions Via Wood Cubes	0	1	0	2	0
0	0	0	0	0	C-7--Ring Toss #1-2	0	0	0	0	0
0	0	0	0	0	C-8--Poker Chip Subtraction	0	0	0	0	0
0	0	0	0	1	C-9--#1-2--Multiplication Bingo	0	0	0	0	1
0	0	0	0	3	C-10--Adding Machine Tape	0	0	1	1	1
0	0	0	0	3	C-11--#1-8-Solvit-Ratio & Proportion	0	0	0	2	1
0	0	0	0	1	C-12-#1-2--Popbottles	0	0	0	1	1
					Form 4 - (N = 6)					
0	0	0	0	0	C-13-#1-2--Fractional Parts Using Cuisenaire Rods	0	0	0	0	0
0	0	0	0	3	C-14--Mosaic Title	0	0	0	0	2
0	0	0	0	0	C-15--The Inch Ruler	0	0	1	0	0
0	0	0	0	0	C-16--#1-2--Pop Bottles & Sand	0	0	0	0	0
0	0	0	0	0	C-17--#1-2--Pair of Adding Machine Tapes	0	0	0	0	0
0	0	0	0	0	C-18--Slide Rule	0	0	0	0	0
0	0	0	4	0	C-19--Percent Bar	0	0	0	2	2
0	0	0	0	0	C-20--Lab--SAERA	0	0	0	0	0
1	0	0	0	0	C-21--Poker Chip Grab	0	0	0	0	0
1	0	0	1	2	C-22--Overplays-Converting Fractions to Decimals	0	0	3	0	1
0	0	0	0	4	C-23--Plotting Points on a Graph	0	0	2	0	3
0	0	0	0	0	C-24--Division Via Wood Cubes	0	0	0	0	0

STUDENTS INVOLVED						REACTIONS				
0-10%	11-25%	26-50%	51-75%	76-100%		Dislike 1	2	3	4	Like 5
0	0	0	0	0	C-25 #1-3--Percent Computer	0	0	0	0	0
0	0	0	0	0	C-26--Area of a Circle	0	0	0	0	0
0	0	0	0	2	C-27--Geoboard Snap	0	0	0	0	2
0	0	0	3	3	C-28--Curve Stitching	0	0	1	2	3
0	0	0	0	0	C-29--Ground Sketching #1-2	0	0	0	0	0
0	0	0	0	3	C-30--P.V.W. Cubes	0	0	1	3	0
0	0	1	0	1	C-31--Meter Stick Decimal Add.	0	0	1	0	0
0	0	0	0	0	C-32--String and Meter Stick	0	0	0	0	0
0	0	0	0	0	C-33--MAXI	0	0	0	0	0
0	0	0	0	0	C-34--#1-2--Felt-Board & Chalkboard	0	0	0	0	0
0	0	0	0	0	C-35-#1-5--Balance Scale With Hooks & Washers	0	0	0	0	0
0	0	0	0	0	C-36--Square It	0	0	0	0	0
0	0	0	0	2	C-37--#1-2--Fraction Cubes	0	0	1	1	0
					Form 5 - (N = 4)					
0	0	0	0	0	C-38 #1-3--Rounding Cubes	0	0	0	0	0
0	0	0	3	1	C-39--Geoboard Fractions	0	0	0	3	1
0	0	0	1	1	C-40--Geoboard-Area & Perimeter	0	0	0	0	2
0	0	0	0	0	C-41--#1-3--Sliding Conversation Scale	0	0	0	0	0
0	0	0	0	0	C-42--Thirty-One Words	0	0	0	0	0
0	0	0	0	0	C-43--Number Draw	0	0	0	0	0
0	0	1	1	0	C-44--Percent Wheel	0	0	0	1	1
1	0	0	0	0	C-45--Scientific Notation Calculator	1	0	0	0	0
0	0	0	0	0	C-46--Egg Beater	0	0	0	0	0
0	0	1	3	0	C-47--Finding Fraction & % Equiv.	0	0	2	2	0
0	0	0	0	0	C-48--#1-2--Meter Stick Division & Multiplication of Decimals & Whole Numbers	0	0	0	0	0
0	0	0	0	0	C-49--#1-2--Trundle Wheel Construction and Use	0	0	0	0	0
0	0	0	0	0	C-50--Cannonball	0	0	0	0	0
0	0	0	0	0	C-51--Circle-Hex	0	0	0	0	0
0	0	0	1	0	C-52--Decimal Division Ruler	0	0	0	1	0
0	0	0	0	0	C-53--Finger Multiplication	0	0	0	1	0
0	0	0	0	0	C-54--Peanuts Character Attri.	0	0	0	0	0
0	0	0	0	0	C-55--Colored Counters	0	0	0	0	0
0	0	0	1	0	D-1--Lab-Living It Up	0	0	0	1	0
0	0	0	0	0	D-2--#1-2--Dining Out	0	0	0	0	0
0	0	0	0	0	D-3 #12--Home Quadrangle Colo.	0	0	0	0	0
0	0	0	0	0	D-4--Poudre Pass Recreation Area	0	0	0	0	0
0	0	0	0	0	D-5--Chambers Lake	0	0	0	0	0

STUDENTS INVOLVED						REACTIONS				
0- 10%	11- 25%	26- 50%	51- 75%	76- 100%		Dislike 1	2	3	4	Like 5
					Form 6					
0	0	0	0	0	D-6--N U T S!	0	0	0	0	0
0	0	0	0	0	D-7 #1-2--UerCity	0	0	0	0	0
0	0	0	0	0	D-8 #1-2--Music Programming (D.J.)	0	0	0	0	0
0	0	0	0	1	D-9--Life or Death	0	0	0	1	0
0	0	0	0	0	D-10--King of the Road	0	0	0	1	0
0	0	0	0	0	D-11--Grandma's Bakery	0	0	0	0	0
0	0	0	0	2	D-12--Apollo 12	0	0	0	1	1
0	0	0	0	2	D-13--Colorado Road Ma	0	0	0	2	1
1	0	0	2	0	D-14--Football	0	0	0	2	1
0	0	0	0	0	D-15--"Mr. Restaurant"	0	0	0	0	0
0	0	0	0	0	D-16 #1-2--Community Improvement	0	0	0	0	0
0	0	0	0	0	D-17 #1-2--Orphans Trip	0	0	0	0	0
0	0	0	0	0	D-18 #1-3--1040	0	0	0	0	0
0	0	0	0	0	D-19 #1-2--Designing and Operating a Golf Driving Range	0	0	0	0	0
0	0	0	0	0	D-20 #1-2--Pick-a-Job	0	0	0	0	0
0	0	0	0	0	D-21--Delivery Boy	0	0	0	0	0
0	0	0	0	0	D-22--Following the Meter Maid	0	0	0	0	0
0	0	1	1	0	H-1--Jet-O-2	0	0	1	1	0
0	0	0	1	0	E-2--Jet-O-2	0	0	0	1	0
0	0	0	0	0	E-3--Two-A-Part	0	0	0	0	0
0	0	0	0	2	E-4--#1-2--Perko-1	0	0	1	0	1
0	0	0	0	2	E-5--#1-2--Perko-2	0	0	1	0	1
0	1	0	0	0	E-6--Zero In	0	0	1	0	0
0	1	0	0	1	E-7--S'MAD 1	0	0	1	0	1
0	1	0	0	1	E-8--Nullo	0	0	1	0	1
					Form 7 (N = 9)					
1	0	0	0	1	E-9--Cross Dissection	0	0	1	0	1
1	0	0	0	4	E-10--#1-4--Equalities-Decimals	0	0	1	2	2
1	0	0	0	0	E-11--Musical Wheels	1	0	0	0	0
0	5	1	1	2	E-12--Center Peg	0	0	2	4	3
3	0	2	1	2	E-13--Ten Men In A Boat	0	0	1	6	2
0	0	1	1	6	E-14--Soma Cubes	1	0	0	1	7
1	0	0	0	2	E-15--Hiddinga Twister	0	0	2	1	1
0	1	0	0	3	E-16--Pascal's Leap	0	1	0	1	3
2	1	2	1	1	E-17--Topo-2	0	1	2	3	0
3	0	2	1	1	E-18--Topo-1	0	0	0	5	0
0	0	0	2	0	E-19--Road Runner	0	0	0	1	1
1	0	0	2	3	E-20--Instant Madness	0	0	1	3	2
0	0	0	2	3	E-21--Butterfly Puzzle	0	0	0	1	5

STUDENTS INVOLVED						REACTIONS				
						Dislike				Like
0-10%	11-25%	26-50%	51-75%	76-100%		1	2	3	4	5
0	0	0	0	1	E-22--Five-O-Gram	0	0	0	0	1
1	0	0	0	0	E-23--Quadrix	0	0	0	0	0
2	0	0	0	0	E-24--Reversal	0	0	0	1	0
1	2	1	0	0	E-25--NIM	0	0	0	4	0
0	0	3	3	3	E-26--Tower of Hanoi	0	0	0	3	5
1	0	0	1	2	E-27--Dissected Square	0	0	1	1	1
1	0	0	1	0	E-28--Garage Shuffle	0	0	0	1	0
1	0	0	0	0	E-29--Square One	0	0	0	0	0
1	0	0	2	0	E-30--Dissected "T"	0	0	0	0	2
1	1	0	1	0	E-31--Dissected "E_1"	0	0	0	1	1
1	1	2	0	1	E-32--Bing Tac	0	0	1	1	2
					Form 8 (N = 8)					
0	0	0	1	3	E-33--Game of 50	0	0	0	2	3
0	1	0	1	0	E-34--Go-Broke: Build-up	0	1	0	0	1
0	0	1	0	2	E-35--Maze 4	0	0	0	3	1
0	0	2	0	1	E-36-- #1-2--GEO Puzzles-Group 1	0	0	0	1	1
2	0	0	1	0	E-37--Star Trick	0	0	0	1	1
0	0	0	0	3	E-38--HI-LO	0	0	0	0	3
1	0	0	0	0	E-39--Pentaholan	0	0	0	0	0
2	0	1	0	1	E-40-- Battleship	0	0	0	2	1
0	0	0	0	0	E-41--UPAYR NOKEEP	0	0	0	0	0
1	0	0	0	1	E-42--Conquer	0	0	0	1	1
1	1	0	1	0	E-43--Dissected "E_2"	0	0	0	1	1
1	0	0	0	1	E-44--Life's Like That	0	0	1	1	0
0	0	2	0	2	E-45--Dice and Decimals	0	0	2	1	1
3	0	0	0	0	E-46--Wild Five	0	1	0	1	0
1	0	0	2	0	E-47--VOODOO	0	0	1	2	0
1	0	0	1	0	E-48--Sweetheart	0	0	1	1	0
0	0	0	0	1	E-49 #1-2--R-O-W-N	0	0	1	1	0
0	0	0	0	0	E-50 #1-2--R-O-D-N	0	1	0	1	0
1	0	0	1	1	E-51 #1-3--Recreation in Arithmetic	0	0	0	2	1
1	0	1	0	0	E-52--Suition	0	0	0	1	0
0	0	0	0	2	E-53--Measuring Angles	0	0	0	2	1
0	0	1	0	7	E-54 #1-3--Linus' Lines	0	0	0	2	6
0	0	0	0	1	E-55--LHD	0	0	0	0	1
0	0	0	0	2	E-56--Concentration	0	0	0	1	1
					Form 9 - (N = 4)					
0	0	1	0	0	E-57--Twenty-One	0	0	0	1	0
0	1	1	0	0	E-58--X-pression	0	0	0	1	1
0	0	0	2	2	E-59--CONTIG	0	0	0	1	3
0	0	0	0	0	F-1--PI Exists	0	0	0	0	0
0	0	0	0	0	F-2--#1-5--Where in the World??	0	0	0	0	0
0	0	0	0	0	F-3--Cut Up	0	0	0	0	0
0	0	0	0	0	F-4--#1-2--Build a Square 1	0	0	0	0	0
1	0	0	0	0	F-5--Lab--Finding Averages	0	0	1	0	0

STUDENTS INVOLVED						REACTIONS				
0-10%	11-25%	26-50%	51-75%	76-100%		Dislike 1	2	3	4	Like 5
0	1	0	0	0	F-6--Lab--Finding Averages	0	0	1	0	0
0	0	0	0	0	F-7--Lab--Volume Comparisons by Use of Sand	0	0	0	0	0
0	0	0	0	0	F-8--Lab--GEOMO	0	0	0	0	0
1	1	0	0	0	F-9--Lab--Sparky	0	0	1	0	0
0	0	0	0	0	F-10--Indirect Measurement	0	0	1	0	0
0	0	0	0	0	F-11--Stadia	0	0	0	0	0
0	0	0	0	0	F-12--Planning A Student Center	0	0	0	0	0
0	0	0	0	0	F-13--#1-2--Student Parking	0	0	0	0	0
0	0	0	0	1	F-14--#1-3--Exercises on Probability	0	0	0	0	1
0	0	0	0	0	F-15--Hypeometer and S.A.C.S.	0	0	0	0	0
0	0	0	0	0	F-16--Cash Register	0	0	0	0	0
0	0	1	1	0	F-16 #2--Change	0	0	2	0	0
0	0	0	0	0	F-17--Geometry for Art	0	0	0	0	0
0	0	0	0	0	F-18--#1-2--Steerclear of the Fuzz	0	0	0	0	0
0	0	0	0	0	F-19--110 MPH....Baseball?	0	0	0	0	0
0	0	0	0	0	F-20--Party Menus	0	0	0	0	0
					Form 10 - (N = 3)					
0	0	1	0	0	F-21 #-4--Human Response	0	0	0	0	1
0	0	0	0	0	F-22--Compass Bearing	0	0	0	0	0
0	0	0	0	0	F-23--#1-2--How Big is Big?	0	0	0	0	0
0	0	0	0	0	F-24--Island Hopping	0	0	0	0	0
0	0	0	1	0	F-25--Buying a Used Car	0	0	0	0	1
0	0	0	0	0	F-26-- #-3--Probability Area	0	0	0	0	0
0	0	0	0	0	F-27--#1-2--Multiples	0	0	0	0	0
0	0	0	0	0	F-28--#1-2--Basketball Throw	0	0	0	0	0
0	0	1	0	0	F-29--#1-2--Prim Factors	0	0	1	0	0
0	0	0	0	0	F-30--#1-2--Stop the Music	0	0	0	0	0
0	0	0	0	0	F-31--#1-2--Witch-Mapping	0	0	0	0	0
0	0	0	0	0	F-32--#1-3--Clocks	0	0	0	0	0
0	0	0	0	0	F-33--How High Is Up?	0	0	0	0	0
0	0	0	0	0	F-34--#1-2--Cabages and Kings	0	0	0	0	0
0	0	0	0	0	F-35--#1-2--Human Tic-Tac-Toe	0	0	0	0	0
0	0	0	0	0	F-36--#1-3--Number Hop	0	0	0	0	0
0	0	0	0	0	F-37--Earth Day	0	0	0	0	0
0	0	0	0	0	F-38--How Far?	0	0	0	0	0
0	0	0	0	0	G-1 #1-9--Fluid Grouping	0	0	0	0	0
0	0	1	2	0	G-2--The Geoboard	0	0	1	1	1
0	0	0	0	0	G-3--Adders and Calculators in the Classroom	0	0	0	1	0
0	0	0	0	0	G-4--#1-2--What ... ?	0	0	0	0	0
0	0	0	0	0	G-5--#1-8--Tape Recorders	0	0	0	0	0
0	0	0	0	0	G-6--#1-2--One-handed Number Systems	0	0	0	0	0
1	0	1	1	0	G-7--Tangrams	0	0	1	2	0

STUDENTS INVOLVED						REACTIONS				
						DisTike				Like
0-10%	11-25%	26-50%	51-75%	76-100%		1	2	3	4	5
					Form 11 - (N = 2)					
0	0	1	0	1	G-8--Napier's Rods	0	0	1	0	1
0	0	0	0	2	G-9--Thinkers	0	0	0	1	1
0	0	1	0	0	G-10--Current News	0	0	1	0	0
0	0	0	0	1	G-11--#-2--Car for Less	0	0	1	0	0
0	0	0	0	0	G-12--Buy It Cheap	0	0	0	0	0
1	0	0	0	0	G-13--Teletype-Computer	1	0	0	0	0
0	0	0	0		G-14--Mathematical terms-Bulletin Board	0	0	2	0	0
0	0	0	0	0	G-15--#1-2--Twirl-A-Power	0	0	0	0	0
0	0	0	0	1	G-16--10,9,8.7.6,5,4,3,2, 1 Blast-Off	0	0	0	1	0
0	0	0	0	1	G-17--Change Machine	0	0	0	0	1
0	0	0	0	1	G-18 #1-8--Colorado Countries	0	0	0	1	0
0	0	0	0	1	G-19 #1-8--Job Information	0	0	0	1	0
0	0	0	0	0	G-20 #1-3--Credit Information	0	0	0	0	0
0	0	0	0	2	G-21 #1-2--Squaring Fives	0	0	1	1	0
0	0	0	1	1	G-22--Base Ten abacus	0	0	1	0	1
0	0	0	0	2	H-1--Banking	0	0	0	1	1
0	0	0	0	1	H-2--Making Change at Dari-Delite	0	0	0	0	1
0	0	0	0	0	H-3--Home Furnishing Costs	0	0	0	0	0
0	0	1	0	1	H-4--Tipping	0	0	2	0	0
0	0	0	0	0	H-5--Roller City	0	0	0	0	0
0	0	0	0	0	H-6--Payroll Deductions	0	0	0	0	0
0	0	0	0	0	H-7--Kitchen Witchen	0	0	0	0	1
0	0	0	0	0	H-8--Save While Spending	0	0	0	0	0
0	0	0	0	0	H-9--Cost-Construction--Home	0	0	0	0	0
0	0	0	0	0	H-10--#1-2--Money, Money, Money	0	0	0	0	0
					Form 12 - (N = 1)					
0	0	0	0	0	H-11--Wage and Deductions	0	0	0	0	0
0	0	0	0	0	H-12--Care and Engine Speed	0	0	0	1	0
0	0	0	0	0	H-13--Rent or Buy?	0	0	0	1	0
0	0	0	0	0	H-14--Let's Wire It	0	0	0	0	0
0	0	0	0	0	H-15--Car Engine Displacement	0	0	0	1	0
0	0	0	0	0	H-16--Guitar Problem	0	0	0	0	0
0	0	0	0	0	H-17--Care Engine Compression Ratio	0	0	0	0	0
0	0	0	0	0	H-18--Snow Job	0	0	0	0	0
0	0	0	0	0	H-19--Teen-Ager's First Auto	0	0	0	1	0
0	0	0	0	0	H-20--Credit Applications	0	0	0	0	0
0	0	0	0	0	H-21--Good Ol'Days	0	0	0	0	0
0	0	0	0	0	H-22--Cover-Up	0	0	0	0	0
0	0	0	0	0	H-23--Rifle Storage	0	0	0	0	0
0	0	0	0	0	H-24--How Free is Free?	0	0	0	1	0
0	0	0	0	0	H-25--Let's Earn Money !!!	0	0	0	0	0

STUDENTS INVOLVED						REACTIONS				
						Dislike				Like
0-10%	11-25%	26-50%	51-75%	76-100%		1	2	3	4	5
0	0	0	0	0	H-26--Let's Spend Money!!!	0	0	0	0	0
0	0	0	0	0	H-27--Where Does Your Money Go	0	0	0	1	0
0	0	0	0	0	H-28--Kool It	0	0	0	0	0
0	0	0	0	0	H-29--$200.00 Purchase	0	0	0	0	0
0	0	0	0	0	H-30--Rustic Fence	0	0	0	1	0
0	0	0	0	0	H-31--Auto-Protection	0	0	0	0	0
0	0	0	0	0	H-32--Tires, Inc.	0	0	0	0	0
0	0	0	0	0	H-33--Shelve It!	0	0	0	0	0
					Form 13 - (N = 1)					
0	0	0	0	0	I-1--You Rock, We Sock!	0	0	0	0	0
0	0	0	0	0	I-2--Hot Rod It!	0	0	0	0	0
0	0	0	0	0	I-3--Arts and Crafts Projects	0	0	0	0	0
0	0	0	0	0	I-4--Wired for Sound	0	0	0	0	0
0	0	0	0	0	I-5--Rifles and Shotguns	0	0	0	0	0
0	0	0	0	0	I-6--Motor Biles	0	0	0	0	0
0	0	0	0	1	I-7--Bowling Along	0	0	0	0	1
0	0	0	0	0	I-8--Catch a Whopper	0	0	0	0	0
0	0	0	0	0	I-9--"x" Ain't Algebra	0	0	0	0	0
0	0	0	0	0	I-10--Wrestling	0	0	0	0	0
0	0	0	0	0	I-11--Basketball	0	0	0	0	0
0	0	0	0	0	I-12--#1-2--Pack-it-Back	0	0	0	0	0
0	0	0	0	0	I-13--Up, Up and Away	0	0	0	0	0
0	0	0	0	0	I-14--Buy or Make?	0	0	0	0	0
0	0	0	0	0	I-15--Splash!	0	0	0	0	0
0	0	0	0	0	I-16--Fly, Cruise, or Crawl?	0	0	0	0	0
0	0	0	0	0	J-1 #1-2--Wreckono	0	0	0	0	0
0	0	0	0	0	J-2 #1-2--Your Chances?	0	0	0	0	0
0	0	0	0	0	J-3 #1-2--Help! Help!	0	0	0	0	0
0	0	0	0	0	J-4--Fly the Friendly? Skies?	0	0	0	0	0
0	0	0	0	0	J-5--Buy Me!	0	0	0	0	0
0	0	0	0	0	K-1--Appliance Repair	0	0	0	0	0
0	0	0	0	0	K-2--Carpentry Low Bid	0	0	0	0	0
0	0	0	0	0	K-3--#1-2--Brown Gables	0	0	0	0	0
					Form 14 - (N = 1)					
0	0	0	0	0	K-4--Board Feet	0	0	0	0	0
0	0	0	0	0	K-5--Alfies Dilemma	0	0	0	0	0
0	0	0	0	0	K-6--You're All Wet	0	0	0	0	0
0	0	0	0	0	K-7--Stronger than Dirt	0	0	0	0	0
0	0	0	0	0	K-8--#1-3--Applying for A Job	0	0	0	0	0
0	0	0	0	0	K-9--What's the Value?	0	0	0	0	0
0	0	0	0	0	K-10 #1-2--Sarah Strutznice	0	0	0	0	0
0	0	0	0	0	K-11--Stew Who?	0	0	0	0	0
0	0	0	0	0	K-12--Set'em Straight	0	0	0	0	0
0	0	0	0	0	K-13--Lady Barber?	0	0	0	0	0
0	0	0	1	0	K-14--Preparing for Year-end Sale	0	0	0	0	1
0	0	0	0	0	K-15--Philcheck	0	0	0	0	0
0	0	0	1	0	K-16--Completing Sales Slips	0	0	0	0	1
0	0	0	1	0	K-17--Pay Roll Change	0	0	0	0	1

Teacher Questionnaire - An in-service meeting was held in March for the teachers. During the meeting the teachers completed a form on which they were asked to indicate their feeling about whether the project objectives had been met. The following table contains the tabulation of responses to the first objective. The numbers are percentages with an N=82.

Objective one will be attained if there is evidence of:	Do you feel that the objective has been met?		
	Yes	?	No
a. a mathematics laboratory environment.	73	1	26
b. flexibility of material usage, classroom organization, and pupil activities in an effort to adaptto individual differences of pupils.	86	3	11
c. pupil growth after deficiency diagnosis.	75	5	20
d. positive student attitude.	90	1	9

Generally, the majority of the responding teachers believe the sub-objectives have been met, and thus that the first objective for this year has been met.

Teacher Attitudes - A semantic differential type form was taken by the teachers in September to determine their feelings at the start of the year on some key concepts. The form was readministered in April. Unfortunately, about half of the teachers did not complete the forms in April.

The charts following this discussion show the pattern of response in terms of mean score on scale. The data were tabulated for junior high and high school teachers separately. There were no differences between the two groups so the data were combined. The N for pre and post is shown as an approximate number because there are slight variations in this on the scales. Thus, on the pretext, 108 might have responded to one scale and 111 to another, but the central tendency was at 110.

There are some changes in means from pre-test to posttest. When the data from those teachers who responded to both forms were analyzed, however, none of the changes were statistically significant.

The teachers checked the favorable end of the bi-polar scales on all concepts on both the pre and post administrations. It is important that their apparently favorable feelings at the start of the year persisted to the end of the year.

Teacher Semantic Differential

O - pretest
X - posttest

Mathematics

	1	2	3	4	5		N ≃ 110 Pre	N ≃ 65 Post
dull					X O	interesting	4.7	4.7
routine					X O	challenging	4.6	4.6
dislike					O X	like	4.7	4.8
boring				O X		fun	4.4	4.6
unpleasant				X O		pleasant	4.5	4.3
tedious				X O		stimulating	4.4	4.3

Slow Learners

							Pre	Post
dull				O X		interesting	3.9	4.0
routine				O X		challenging	4.4	4.6
dislike				O X		like	3.8	4.2
boring				O X		fun	3.6	4.0
unpleasant				O X		pleasant	3.5	3.7
tedious				O X		stimulating	3.5	3.6

Mathematics Laboratory

							Pre	Post
dull					X O	interesting	4.5	4.5
routine				O	X	challenging	4.3	4.6
dislike				X O		like	4.4	4.4
boring				O X		fun	4.3	4.4
unpleasant				X O		pleasant	4.2	4.2
tedious				X O		stimulating	4.3	4.2

Teacher Aide

							Pre	Post
dull				O X		interesting	3.8	3.9
routine				X O		challenging	3.7	3.7
dislike				O X		like	4.0	4.3
boring				O X		fun	3.7	3.8
unpleasant				O X		pleasant	3.9	4.1
tedious				X O		stimulating	3.7	3.6

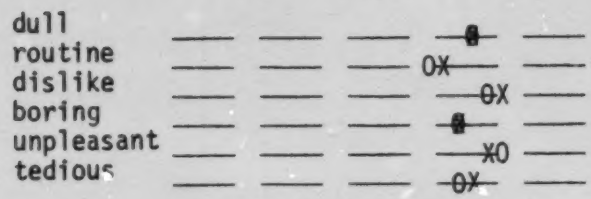
My Self

							Pre	Post
dull				X O		interesting	3.8	3.8
routine				X O		challenging	3.9	3.9
dislike				O X		like	4.1	4.2
boring				X O		fun	4.0	4.0
unpleasant				X O		pleasant	4.1	4.1
tedious				X O		stimulating	3.9	3.7

COLAMDA

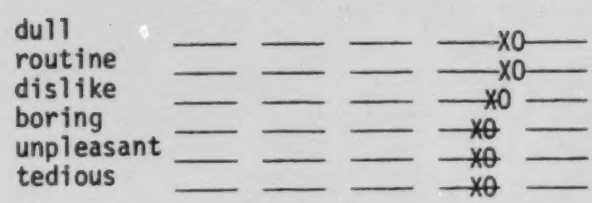
	Pre	Post
interesting	4.5	4.4
challenging	4.4	4.5
like	4.4	4.5
fun	4.3	4.4
pleasant	4.2	4.3
stimulating	4.3	4.3

My Principal



	Pre	Post
interesting	4.0	4.0
challenging	3.6	3.8
like	4.3	4.5
fun	3.8	3.8
pleasant	4.3	4.2
stimulating	3.8	3.9

Personalized Instruction



	Pre	Post
interesting	4.5	4.4
challenging	4.6	4.5
like	4.5	4.3
fun	4.2	4.1
pleasant	4.2	4.0
stimulating	4.3	4.0

Student Attitudes - Our attention thus far has been on whether the project was actually implemented in the classrooms. The information on this point is not conclusive, but it does support a conclusion that the materials and techniques of COLAMDA were used by teachers who were willing and able to use them as intended.

The ultimate point of the project, of course, is to facilitate the learning of mathematics by students with a history of low achievement in the subject. Thus, the one most important concern is the impact of the project on the students.

One kind of impact is in the area of student attitudes. In order to assess attitudes a semantic differential type instrument was used. The instrument was administered to a random sample of students in October and to a different random sample in April. Thus, there is a sample from the fall population and a sample from the spring population. The results are shown in the charts following this discussion.

The data from the high school and junior high school students were analyzed separately. No differences were found so the data were combined. The general results were that there was a favorable feeling toward all of the concepts except "homework" at the start of the year and this persisted to the end of the year. The feeling toward the concept. "My School" was less favorable at the end of the year than at the start. This is a typical result in attitude toward school studies. The feeling toward the concept "Homework" improved from the start to the end of the year.

Generally the students rated the concepts quite favorably both times. The project apparently had little impact on student attitudes measured by this instrument in either a positive or negative sense.

Student Semantic Differential
(*Change significant at .05 level)
0 - pretest
X - posttest

	1	2	3	4	5		N-180 Pre	125 Post
Arithmetic								
bad				XO		good	3.9	3.8
unpleasant				XO		pleasant	3.7	3.6
dull				XO		interesting	3.6	3.5
boring				XO		fun	3.7	3.6
worthless				OX		valuable	4.1	4.3
useless				OX		useful	4.3	4.4
My School							Pre	Post
bad				X O		good	4.1	3.5*
unpleasant			X	O		pleasant	3.9	3.4*
dull			X	O		interesting	3.8	3.4*
boring			X	O		fun	3.9	3.2*
worthless				XO		valuable	4.0	3.9
useless				XO		useful	4.2	4.0
Teacher Aide							Pre	Post
bad				XO		good	4.0	3.9
unpleasant				OX		pleasant	3.8	4.0
dull				OX		interesting	3.5	3.7
boring				O		fun	3.7	3.7
worthless				O		valuable	3.9	3.9
useless				OX		useful	3.9	4.1
Homework							Pre	Post
bad			O X			good	2.7	3.0*
unpleasant			OX			pleasant	2.5	2.6
dull			OX			interesting	2.5	2.7
boring			OX			fun	2.3	2.5
worthless				O		valuable	3.6	3.6
useless				O		useful	3.6	3.6
Mathematics Laboratory							Pre	Post
bad				XO		good	4.3	4.2
unpleasant				XO		pleasant	4.1	4.0
dull				XO		interesting	4.1	3.9
boring				O		fun	3.9	3.9
worthless				XO		valuable	4.1	4.0
useless				XO		useful	4.1	4.0

My Mathematics Teacher							Pre	Post
bad	___	___	___	XO	___	good	4.5	4.4
unpleasant	___	___	___	XO	___	pleasant	4.3	4.2
dull	___	___	___	X O	___	interesting	4.3	4.0*
boring	___	___	___	X O	___	fun	4.2	3.8*
worthless	___	___	___	XO	___	valuable	4.3	4.2
useless	___	___	___	O	___	useful	4.4	4.4

Student Performance - Two indications of student performance in mathematics were used. One was pre-post on the mathematics sub-tests of the Stanford Achievement Test and the other was from some tests built for the project.

The following design was used for the pre-post administration of the Stanford. One hundred twenty of the classrooms were selected at random in the fall. These were randomly divided into two groups of 60 each. One group was used for the pretest and the other group for the posttest. The groups of 60 were then divided randomly into three groups. Twenty were to take the applications test, 20 the computation test, and 20 the concepts test. The following chart shows the design.

Test	Pretest	Posttest
Applications	20 classrooms	20 classrooms
Computation	20 classrcoms	20 classrooms
Concepts	20 classrooms	20 classrooms

The classroom mean was the unit of analysis. The number of students in the classrooms was quite similar.

This design was used to control for the regression effect, to reduce testing in any one classroom, and to eliminate the problem of not getting complete data such as is often encountered when tests are given on a pre-post basis to the same units. This last problem was not completely solved, however, in that the tests were not administered in all of the 20 classrooms in each cell. The following table shows the results for the total group and for junior high and high shcool classrooms. Recall that the scores used are classroom mean grade equivalents.

		N	$\bar{X}$	S.D.	t	one-tail Prob.
			Total Group			
Applications	pre	13	6.31	.97	.75	N.S.
	post	15	6.66	1.32		
Computation	pre	13	5.07	1.02	1.86	$<.05$
	post	14	6.38	2.00		
Concepts	pre	11	6.24	.66	1.5	$<.10$
	post	14	6.99	1.39		
			Junior High			
Applications	pre	10	5.96	.70	.84	N.S.
	post	13	6.25	.85		
Computation	pre	9	4.87	.81	2.14	$<.05$
	post	10	5.59	.61		
Concepts	pre	7	6.03	.67	1.39	$<.10$
	post	11	6.75	1.18		

		High School N	$\bar{X}$	S.D.	t	one-tail Prob.
Applications	pre	3	7.47	.86	2.11	$<.10$
	post	2	9.30	.50		
Computation	pre	4	5.53	1.27	1.65	$<.10$
	post	4	8.35	2.68		
Concepts	pre	4	6.60	.46	1.19	N.S.
	post	3	7.87	1.70		

For the total group there was a significant gain on the computations and concepts subtest. On the computation test the gain was about 1.3 years and the test-retest interval was about seven months. On the concepts test the gain was about .7 years. Thus, the gain was more than would be expected on the basis of the past performance of the students. The pattern of change was the same in junior high and high school classrooms.

The results suggest that the project did have a beneficial impact on performance in the areas tested by the Stanford computation and concepts subtest. This conclusion must be tentative, however, because of the incomplete results on the tests. It may be that the classrooms that did not give the tests are typical and if complete data were available the results might differ.

A second indication of student performance was from a modified matrix sampling procedure. The participating COLAMDA teachers built 40 forms of 12 items each. The items of the forms were written to measure one of the many mathematics behaviors taught in the classes. In effect, there were 480 items over things like percents, decimals, operations, etc. One form had 12 items from the range of behaviors. It was intended that the forms would be distributed randomly among the classrooms with the restriction that no more than nine of any form go to one classroom. The tests were administered in October and April to all students in the project. Appendix A contains the test forms and a table showing the performance of junior high and high school students separately on each item and the performance for the total group. The numbers in the total group column are percentages, while the numbers in the other columns are the numbers who answered the item correctly.

It is obvious that the random administration procedure broke-down. Apparently some teachers administered only one form to all students in the class. Even so the data are rich if one takes the time to examine them closely. They do indicate the kinds of things that were and were not taught during the year by the classes in the project.

No summary statistic is appropriate for the results of the project tests. The following table is a frequency distribution of the percent correct changes from pretest to posttest. The results are from 396 items which are those that at least 10 students took on each administration.

50 - 75%	increase -	2	.5
25 - 49%	increase -	52	13.1
1 - 24%	increase -	223	56.3
0	increase -	7	1.7
1 - 24%	decrease -	102	25.8
- 49%	decrease -	10	2.6

There was an increase in the percentage correct from pretest to posttest on 70% of the items and no change or a decrease on 30% of the items. The median change was a 7% increase in the percent correct from pretest to posttest. A sign test of hypothesis of no significant change indicated that at the .01 level of confidence there was a significantly greater number of positive changes than would have been expected on the basis of chance alone. The results do indicate an improved performance during the year on the behaviors measured by these tests.

Summary for Objective One

The results do indicate that the first objective was quite well-attained. Most of the teachers learned to use the materials and techniques and did use them in their classes. On the other hand, there was also a sizable minority of teachers who apparently were not able or did not choose to implement the project in their classes. They seemed to be overwhelmed by the materials and did not get the support they needed.

The students in the project seem to have benefitted. They held positive feelings toward certain important concepts and generally showed performance increment in mathematics greater than would be predicted from past performance.

The writer wishes to stress that the problem of incomplete data is serious. This project, as is true of most projects of this size, was plagued by not getting all of the data needed and by teachers not following instructions. Hopefull, however, the data are better than no data at all, but one is also haunted by the saying that "inadequate information is worse than no information." The writer believes that evaluation of projects like this is important. So important, in fact, that the participant must be told explicitly that it will occur, what will occur, and that participation is contingent upon agreement to do what is needed for the evaluation. We recognize that many forms and tests were used, but these are necessary to obtain the information that is needed for a complete and comprehensive report. One of our professional obligations is to provide complete and accurate information about what occurs. This is the first and important step in being accountable.

Objective Three

The third general objective of the project dealt with diffusion. The model for the diffusion phase is described in another project report

The data sources with respect to the attainment of this objective are as follows:

1. Impact of Spring, 1970, luncheons.
2. Administrator interview
3. Teacher questionnaire
4. College teacher response.

The information is presented in this order. Impact of Spring luncheons - In the spring of 1970 the COLAMDA staff held two luncheons for principals and teachers in the schools that were participating in COLAMDA during the 69-70 school year. One primary purpose of these meetings was to increase the level of understanding of the principals about COLAMDA. A report was prepared on this activity including data from an opinionaire administered after the luncheon. The general reaction was that the luncheon sessions were effective in increasing understanding of the goals of the COLAMDA project.

Administrator interview - During December and January of this school year (70-71) a sample of 17 administrators was interviewed by the project staff. The following table contains a tabulation of the responses to the items in the structured interview.

Does the administrator:	Yes	?	No
1. Indicate awareness of project objectives and activities?	13	3	1
2. Indicate support for project objectives and activities?	14	2	1
3. Exhibit confidence in COLAMDA teachers?	17	0	0
4. Exhibit support for activities participated in by teachers?	17	0	0
5. Visit the COLAMDA classes?	8	5	4
6. Express or exhibit concern for continuation of project activities?	14	0	3
7. Foresee potential of project objectives and activities in other areas of instruction?	8	4	5
8. Seem willing to assume leadership role in diffusion activities in building and/or district?	8	3	6

The data suggests that these administrators are aware of and sympathetic to the goals of the project. They do not seem to be strongly committed to expansion of the project beyond its present scope, however. This finding is also evident in the results on the teacher questionnaire.

Teacher questionnaire - The following table contains tabulation of responses to items relevant to objective three. These responses were obtained on the questionnaire administered at the in-service meeting in March. The numbers are percentage figures based on an N of 82.

Objective three will be attained if there is evidence of:	Project objective has been met. Yes	?	No
a. effective project related teacher training and/or retraining activities.	78	2	20
b. planning in participating districts for diffusion of project related objectives and activities after termination of federal funding.	50	4	46
c. teacher commitment to low-achiever instruction.	88	4	8
d. acceptance and utilization of COLAMDA coordinating teachers in local districts by peers and administration.	72	2	26
e. awareness and support of project objectives and activities by pre-service teacher-training instructors.	76	4	20
f. administrative and counselor interest and support for continuation of project objectives and activities.	63	12	25
g. provision for appropriate instructional materials for continuation of project related activities.	63	4	33
h. district commitment to develop and implement a low-achiever curriculum.	68	2	30

The results indicate that the teachers are not as sure about whether the project has been diffused effectively within their districts as in other areas. On the other hand, a majority did feel there was commitment to the project.

Perhaps in these times of difficult budget problems it is unrealistic to expect a strong commitment from the districts. Certainly there are many other worthy activities competing for the dollar. It can be considered encouraging that there was not a rejection of COLAMDA. It will be interesting to observe and important to know what does happen next year with respect to continuation of COLAMDA in the districts that participated this year.

College teacher response -

Letters were sent in April to six teacher educators in mathematics in several Colorado teacher education institutions. They were asked to respond concerning their knowledge of COLAMDA and their opinions of the project.

Two persons responded that they knew little about the project. One of these persons forwarded the letter to another person on his campus that was familiar with the project. A response was received from that person.

All of the five teacher educators who responded were very familiar with the project and had positive feelings about it. Rather than attempt to summarize the responses, we have included excerpts from each of the letters.

Letter One

I have used many of the ideas in my methods course and have tried to instill the spirit of the project in my students. The first impression that most students and teachers have of the project is that it is a collection of games used to get students to like mathematics. Although this is a vital and worthwhile objective of the project, I urge the students and teachers to view the materials as a better means of teaching mathematical concepts as well as attitudes.

We have already discovered that most of the materials can be adapted for use by all ability levels throughout the public school grade levels. Many of the students have specifically adapted materials for the elementary students and for high school students.

I feel that the major benefit of the project to teachers in Colorado is that it provides resources for them to improve the mathematics preparation and curriculum of their schools. Too many teachers are "textbook-bound" because of their lack of mathematical background or lack of confidence in trying new ideas. The project materials free them from slavish devotion to a textbook. The project also allows them to use their own creative imaginations to devise new materials. The materials act as a springboard for ideas in mathematics. The use of the materials in our secondary methods course and in our content course for elementary teachers has not only given them ideas for their own teaching, but has increased their understanding of mathematical concepts and attitudes. Another benefit of the project has been to provide low-cost materials for schools. Many of the materials are available from commercial concerns but at a cost two, three even four times as great.

My major regrets about the project are that it has not been available to more teachers and shcool systems in Colorado and that its funding is ending at this time. I feel that every student, teacher, and school system exposed to the project has benefitted from it. The only drawback has occurred when the teacher has only viewed the materials as "games" for diversion, not as intrinsic learning aids. It is a shame that similar projects are not being undertaken in other areas of the curriculum.

As for my own use of the materials and particularly ideas of the project, I only regret that I did not have them ten years ago when I began my teaching.

Letter Two

I judge that the project has had extreme value to those mathematics teachers within the cooperating districts of the project. I base this judgment on personal comments made to me by these teachers and on the fact that the demand for COLAMDA workshops is increasing.

I believe that the project should be extended in several ways. First, the project should be continued for at least two more years under its present context in order to answer the additional needs presented by the junior high schools in the immediate area. Secondly, the project should be extended to include elementary and high school teaching of mathematics. Finally, the philosophy of COLAMDA and methods of solving specific instructional problems should be extended to disciplines other than mathematics.

Your final request for response deals with teacher preparation curriculum. There are at least two aspects of the project which I feel are desirable for this curriculum. The first is the emphasis upon philosophy: teachers sharing with each other, personalizing instruction to fit teacher and pupil, and recognition of the worth of the individual. The other is the emphasis upon the laboratory approach to the teaching of mathematics.

You must perceive from my remarks that I am very pleased with the work of COLAMDA and very proud to have been affiliated with the project in some small way. I would encourage planners of mathematics curricula to seriously consider the model presented by the staff of the project.

Letter Three

As far as my judgment of the worth of the project, there are several aspects which I think have been most valuable outcomes of the project itself. (1) The cooperation that has been encouraged between the many school districts involved in the project. This cooperation is hard to come by in most situations. (2) The cooperation between teachers within schools, teachers between schools, and teachers between school systems as well as subject areas has been most encouraging. It has been my experience that teachers do not communicate as much as they could in order to assist each other in their classroom problems for which the low achiever is one of the most outstanding at the present time. (3) The encouraging attitudes of the teachers and the students involved in the COLAMDA classes within the schools. For the types of students who are involved in the COLAMDA courses, the attitudes which these students have is most encouraging, and I am certain that the project itself has been very instrumental in fostering this attitude on the part of the students. A like attitude is present in the teachers who teach the classes themselves. If any one thing is to be a permanent result of the project, I would hope it would be the change in attitude on the part of the teachers and the students in the classrooms.

The most notable aspect of the project which can and should be extended into other subject areas as well as other aspects of the school situation is the communication that has been fostered, the attitudes on the part of the teachers, and the teacher constructed materials. As we all know, materials that

are not constructed by teachers for use in the classroom generally sit on the shelf in most cases. This is not the case with the COLAMDA materials. They are teacher written and they are used widely in the schools in which they are placed.

I, personally, would like to see within a teacher education program more emphasis on teaching low achievers for which I am pursuing action at the present time, more exposure to materials of the COLAMDA type or materials in general, and once again the fostering of communication between prospective teachers, in-service teachers, and fostering of the attitudes that are present in the COLAMDA courses. One of the most unique features of the COLAMDA program is the workshops which do not consist of lectures but consist of actual hands-on activities by the teachers of the materials being used. Such is not the case in most teacher education programs much to my displeasure.

I feel that the staff of COLAMDA has been doing an outstanding job and do hope that the efforts they have extended will not cease when federal funding ceases in June, and from my experience with talking with teachers concerned this most certainly will be the case.

There is one aspect of the project which I think is a little bit disturbing, that is, that there is very little supportable research data on which to base many of the conclusions which many people have concerning the project itself. Without such research data, school systems, universities, and other projects of that nature question the validity of the data and opinions involved. I feel that if such research data were available there would be less trouble in achieving more funding.

Letter Four

The project made a tremendous contribution to focusing attention on the low achiever and giving widespread leadership in the laboratory approach to teaching mathematics. This approach is important for all teachers to experience in teacher-training programs.

The materials developed and assimilated from many sources have been pupil-tested and is excellent. It should be disseminated on a country-wide basis.

Letter Five

I feel the project has done a great deal to improve mathematics courses for the lower achiever in mathematics at the junior high school and high school level. I observed wide variations of implementation of the philosophy and the materials of the project. Some teachers were using the materials to good advantage, while others were teaching their classes in much

the same way they always had. On the whole, it was my feeling that teachers were taking a greater interest in meeting the individual needs of these students than they had previously.

The extension of the project to other levels would be somewhat doubtful. Many of the aids and games which the project has produced would be useful in the elementary school. However, as far as really providing remedial treatment, the project is probably most useful at the junior high school level. I do not see any need to prolong the project or proliferate it just for the sake of keeping an "organization" functioning. It is my feeling that local school systems should instruct their mathematics coordinators to see that the project is perpetuated in their districts.

I believe features of this project should be included in methods courses for secondary teachers. It might also be included as a small part of graduate courses for elementary teachers. I do not approve of the present practice of offering a course in "games" that have been designed for our junior high school and secondary students and offering graduate credit for such a course.

It is apparent that these math educators feel the project has been worthwhile. Furthermore, there is an indication that the project has had an impact on the teacher education activities of the institutions. It is important to point out that the limitation to junior high level suggested in Letter Five is supported somewhat by the performance data.

Summary on Objective Three

Generally, it would seem that the third objective was reached this year. The real test of attainment of this objective must wait, however, to see what happens in the next few years in the districts. At the present time there seems to be a strong commitment on the part of the teachers to continue and a somewhat lesser commitment on the part of administrators. Continuation and expansion of the project will depend greatly on whether the teachers can exert much influence. If they can't, it is probable that in two or three years there will be little evidence of the project in the districts except for some kits of materials stored in some closets.

There is evidence that the philosophy and methods of COLAMDA will persist through the teacher education route. The math educators are using the materials and methods in their classes and the beginning teachers from these institutions will certainly influence what happens in the schools in the future.

General Summary

The COLAMDA project has had an impact on mathematics instruction in the participating districts. The evaluative data from the 69-70 and 70-71 school years indicate that the low-achieving students did perform at

a rate higher than would be expected. Furthermore, the participants seemed to have positive feelings about their participation.

The project has also had an impact in terms of the large and varied pool of resource materials that have been collected, built, and/or assembled. These materials should prove to be a valuable resource for the field.

There is evidence that it has had some impact that is perceived to be beneficial. The methods, materials, and procedures of COLAMDA deserve serious consideration and study by teachers and administrators who are concerned about improvement of mathematics instruction.

EFFECTS OF TEACHERS' PERSONALITY SYSTEMS, SUBJECT MATTER AND STUDENTS' PERSONALITY SYSTEMS ON TEACHER EVALUATION

A PRELIMINARY REPORT

O.J. Harvey, Kathleen Wells, Curtis Schmidt, and Cathy Grimm

University of Colorado

(TIB)

OPINION SURVEY

Name	Age	Sex	Religious Preference
School	Local phone	Date	Political Preference

INSTRUCTIONS

In the following pages you will be asked to write your opinions or beliefs about several topics. Please write at least two (2) sentences about each topic. You will be timed on each topic at a pace that will make it necessary for you to work rapidly.

Be sure to write what you genuinely believe.

You must write on the topics in the order of their appearance. Wait to turn each page until the experimenter gives you the signal. And once you have turned a page, do not turn back to it.

PLEASE DO NOT OPEN THIS BOOKLET UNTIL YOU ARE INSTRUCTED TO BEGIN.

This I believe about the American way of life:

This I believe about religion.

This I believe about insubordination.

This I believe about marriage.

This I believe about being opportunistic.

This I believe about telling the truth.

This I believe about using drugs.

PERSONAL OPINION SCALE CST-A 2/71

Scale A

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Please mark each st[illegible]t on the answer sheet by filling in the space under the numbers from 1 to 5, depending on how you feel in each case.

1 = I agree completely
2 = I agree mostly (i.e., more than disagree)
3 = I agree and disagree about equally
4 = I disagree mostly (i.e., more than agree)
5 = I disagree completely

---

1. I think I have more friends than most people I know.
2. Contributing to human welfare is the most satisfying human endeavor.
3. No man can be fully successful in life without belief or faith in divine guidance.
4. I feel like telling other people off when I disagree with them.
5. I like to criticize people who are in a position of authority.
6. I like to join clubs or social groups.
7. Any written work that I do I like to have precise, neat and well organized.
8. It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.
9. I like to have my meals organized and a definite time set aside for eating.
10. I like to do things with my friends rather than by myself.
11. I like to help other people who are less fortunate than I am.
12. I like my friends to confide in me and to tell me their troubles.
13. I like to have my work organized and planned before beginning it.
14. I feel like making fun of people who do things that I regard as stupid.
15. Sin is but a cultural concept built by man.
16. I like to keep my things neat and orderly on my desk or workspace.
17. I believe that to attain my goals it is only necessary for me to live as God would have me live.
18. I like to form new friendships.
19. These days a person doesn't really know whom he can count on.
20. Politicians have to bribe people.
21. I like to start conversation.
22. I feel like getting revenge when someone insults me.
23. I like to sympathize with my friends when they are hurt or sick.
24. I like to plan and organize the details of any work I undertake.
25. Guilt results from violation of God's law.
26. I like to give lots of parties.
27. I like to make as many friends as I can.